

Canadian Railway and Marine World

July, 1914.

The June Railway Mechanical Conventions at Atlantic City.

The two great railway conventions of the year, the Master Car Builders' Association, and the American Railway Master Mechanics' Association, were held in Atlantic City, N. J., the former on June 10 to 12, and the latter on June 15 to 17. The most important features of these annual conventions are the reports of the standing and special committees and the individual papers presented, the principal ones of which are given on this and following pages, in full or in abstract.

Report of Committee on the Retirement of 40,000 and 50,000 lbs. Capacity Cars From Interchange Service.

The Master Car Builders' committee, D. F. Crawford, General Superintendent of Motive Power, Pennsylvania Rd., Lines West, chairman, reported as follows:—

At the convention in June, 1913, the question of the retirement of cars of 40,000 and 50,000 lbs. capacity from interchange service was considered and a committee was appointed to consider the question in all of its phases. In the discussion, both in the convention and by the committee, it seemed desirable to give consideration to some of the principal features of the construction of the cars, as well as the marked capacity.

The committee addressed to the members four queries, as given below. Members were also to advise as to the number of cars of the various capacities and several constructions operating on their lines. The following is a summary of the answers received:—

Question 1. Have you any restrictions in force regarding the use of cars of 40,000 and 50,000 lbs. capacity? 84 answered no; 13, yes; 2, yes for 40,000 and no for 50,000; 1, yes for 40,000 only; and 30 gave no replies.

Question 2. Do you accept in interchange cars of 40,000 and 50,000 lbs. capacity? If so, is the lading transferred? 4 answered no; 85, yes; 1 no for 40,000 and yes for 50,000; 1, should be accepted; 3, yes, lading transferred; 3, yes, depending on condition of car; 1, no, lading transferred and charged to us; and 32 gave no replies.

Question 3. Do you regard it practicable to prohibit the use of cars of 40,000 lbs. capacity in interchange? 20 answered no; 62, yes; 2, yes, with sufficient time limit; 2, not at present; 3, yes, depending on construction; 1, consider construction of car; and 40 gave no replies.

Question 4. Do you regard it practicable to prohibit the use of cars of 50,000 lbs. capacity in interchange? 30 answered no; 48, yes; 2, yes, in reasonable time; 3, not at present; 3, yes, depending on construction; 2, in reasonable time; 1, yes, for 40,000; 1, consider construction of car; 1, yes, unless cars are equipped with steel underframe or its equivalent and an all metal truck; and 39 gave no replies.

Of the 138 lines submitting data, the number of cars in revenue service on Jan. 1, 1914, of the several classes, is as follows:— 40,000 lbs. capacity or less: all steel, 8; metal draft arms, 215; wooden draft timbers extending through body bolsters, 29,122; wooden draft timbers extending to body bolsters, 20,522; grand total, 49,867. Of

these, 29,727 have metal body bolsters, and 6,359 American continuous draft gear.

50,000 lbs. capacity and less, but over 40,000 lbs.: steel underframe, 50; steel centre sills, 89; metal draft arms, 11,197; wooden draft timbers extending through body bolsters, 31,413; wooden draft timbers extending to body bolsters, 12,875; grand total, 55,624. Of these, 37,712 have metal body bolsters and 2,796 American continuous draft gear.

Over 50,000 lbs. and less than 60,000: all steel, 161; steel underframe, 492; steel centre sills, 2,217; metal draft arms, 9,192; wooden draft timbers extending through body bolsters, 1,746; wooden draft timbers extending to body bolsters, 5,515; grand total, 19,323. Of these, 17,188 have metal body bolsters, and 23, American continuous draft gear.

60,000 lbs. capacity: all steel, 445; steel underframe, 98,674; steel centre sills, 34,317; metal draft arms, 110,835; wooden draft timbers extending through body bolsters, 166,614; wooden draft timbers extending to body bolsters, 227,881; grand total, 638,766. Of these, 428,758 have metal body bolsters, and 29,617, American continuous draft gear.

The committee recommends that the following proposed rule be submitted to special letter ballot, so that it may, if approved, be embodied in the Rules of Interchange effective Oct. 1, 1914: "After Oct. 1, 1916, all cars of less than 60,000 lbs. capacity, having wooden or metal draft arms which do not extend beyond the body bolster, will not be accepted in interchange."

Report of Standing Committee on Car Wheels.

The Master Car Builders' Committee, W. C. A. Henry, Superintendent of Motive Power, Pennsylvania Rd., chairman, and of which R. W. Burnett, General Master Car Builder, C.P.R., is a member, reported in part as follows:

This subject originated with the Association of Manufacturers of Chilled Car Wheels, and from whom have been received a number of recommendations in the direction of heavier flanges. There is not sufficient available data on the latest design of chilled car wheel to warrant making any recommendations. To increase to any extent the width of flange will involve providing more clearance through frogs, guard rails and railway crossings. The Bureau of Standards of the Department of Commerce, U. S. A., is preparing to make an experimental study of chilled car wheels, which will include foundry practice, investigation into the chemistry, metallurgy and mechanics of wheels, etc., and we are informed that it is their intention to ask the wheel manufacturers and wheel users to co-operate in this investigation.

In order to provide means for measuring flat spots of 1 and 2 ins. long on passenger and freight car wheels respectively, it is recommended that two additional notches be provided on the upper edge of the present standard wheel defect gauge.

Errors were made in the revision of the specifications for wheels in 1913. Under

markings substitute "outside" for "inside," which is in accordance with previous practice. Under thermal test 2 mins. after pouring ceases, an examination must be made, and if the wheel is found broken in pieces, or if any cracks in the plate extend through or into the tread, all wheels of the same tapen size as the wheel broken will be rejected.

Under "branding," the name or brand of the manufacturer, date and serial number, shall be legibly stamped on each wheel; also purchaser's name and serial number, if specified. The tape size shall be legibly marked on each wheel.

The maximum gross weight to be carried by car wheels of 625 lb. weight is not in harmony with the specifications, and shall be corrected to specify a maximum gross weight not to exceed 95,000 lbs.

Physical test for rolled and forged steel wheels is still under investigation. At present, there are three diameters of solid steel wheels specified as recommended practice, 33, 36 and 38 ins., whereas for steel tired wheels there is but one diameter, 33 in. It would seem consistent that we have the same diameters for the steel tired as for the solid wheel.

The Association now has as recommended practice a tire 2½ in. thick, requiring three diameters of wheel centres, namely 28, 31 and 33 ins. To standardize the mounting of tire, wheel centres should be machined to the exact diameter specified, and the tires finish bored to the diameter of the centre less 1-1000 in. for each inch in diameter.

To conform more nearly to the outlines of flanges of maximum thickness the radius with which the gauging point at the throat is struck should be changed from ⅝ to 1 15-16 in. Also ⅝ in. radius for minimum flange thickness gauge to be changed to 1 13-16 in.

Report of Committee on Interline Loading of Commodities.

The Master Car Builders' committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., chairman, reported as follows:

The establishment of a uniform code of rules for the interline loading of commodities, a subject referred to your committee for investigation, was received rather late in the year; indeed too late to permit the research it evidently requires. Hence your committee is only able at this time to offer a report of progress, with the assurance that an effort is being made to ascertain what seems to be necessary to satisfactorily meet the requirements.

Your committee frankly confesses it does not yet have a very clear conception of what is embraced in the question; at the same time it appreciates that there does not seem to be any doubt that a higher efficiency may be assured, and less loss experienced by more securely loading and packing commodities handled in interline shipments. What might be accomplished in that direction, however, is as yet uncertain.

Due to the short time your committee has had the subject in hand, opportunity has been lacking to secure information of any

particular interest. Furthermore, it has not been able to confer with the subcommittee of the American Railway Association on marking, packing and handling of freight, nor with the patron of the suggestion, in con-

ference with whom it is believed a better plan of investigation and course of procedure may be outlined. It is, therefore, the intention of your committee to go into this matter carefully during the coming year.

Report of Committee on Car Construction.

The Master Car Builders' Committee, W. F. Keisel, Jr., Assistant Mechanical Engineer, Pennsylvania Rd., chairman, and of which H. H. Vaughan, Assistant to Vice President, C. P. R., is a member, reported in part as follows:

CENTRE SILLS FOR EXISTING CARS.—To the Arbitration Committee, the following amendment to rule 43 is recommended: "Existing steel or steel underframe cars, which have less strength than specified below, should be classified with wooden cars, and subject to the same rules for combination defects. Area of centre sills not less than 16 sq. in. Ratio of stress to end load not more than 0.09. The length of centre or draft sill members between braces to be not more than 20 d, where d is the depth of the member, measured in the direction in which buckling might take place."

To explain the above we would state that the basis of strength in rule given above is threefold. 1, a minimum section area of centre or draft sills; 2, maximum ratio of stress to strain, and, 3, maximum ratio of length to depth of unsupported members of underframe. The section area given should obtain throughout the length of the sills lying between points where impact takes place. If impact takes place between the coupler horn and end sill, the full length of the centre sills must be considered. If, on the other hand, impact takes place between rear followers, the part of centre sills between these followers should be considered, and the centre sills from the rear followers to the end sill may be lighter. The rivet area holding the back follower stops to the center sills should not be less than 12 sq. ins.

"In determining the ratio of stress to end strain, the distance between the neutral axis of any member of the car and the centre line of strain should be taken as a lever arm, through which bending effect is added to direct tension or compression. A formula for the ratio of stress to end strain is

$$\frac{1}{A} \frac{X}{SM}$$

— plus —, in which A represents area in sq. ins., X represents lever arm in ins., and SM represents section modulus of section.

"The length of centre or draft sill between adjacent tie plates or braces, or the length of any part of any centre sill or draft sill between adjacent supports or braces, must not be more than 20 times the measurement across the section of member under consideration. The measurement across the section referred to must be taken whichever way the member is weaker, which, of course, will be the direction in which the member will buckle if overstrained. As an example: Centre sills consisting of channels tied only at the top by floor plates, and having flanges 2½ ins. wide, may have the bottom flanges braced only at intervals of 8 ft. According to the rule given above, these bottom flanges should have braces at intervals of not more than 20 times 2½ ins., or 50 ins. Such car will, therefore, require an additional brace for anchorage about half way between the existing anchorages."

CENTRE SILLS FOR NEW CARS.—To furnish maximum revenue returns, the money expended for first cost, repairs, and dead weight hauled should be a minimum. It was suggested that two standards for centre sill area be adopted—one for cars in general service, and one for heavy service;

but as both kinds will be hauled in the same trains, this is not practical. Minimum centre sill areas, between points of impact, on existing cars, may vary up to 55 sq. ins. Service experience demonstrates that the cars having minimum centre sill strength are crippled in acting as cushions for the stronger cars. This makes it desirable to aim at uniformity of centre sill strength for all cars in the train. Designs of cars which do not go into general service in interchange may be considered only from their own load carrying standpoint, without regard to train strains; but those used in interchange must be considered from both standpoints. For the latter, your committee recommends the following as minimum design requirements to produce cars giving maximum returns for money expended: Area of centre sills: 24 sq. ins., min. Ratio of stress to end load: 0.06, max. Length of centre or draft sill members between braces: 20 d, max., where d is the depth of the member, measured in the direction in which buckling might take place.

BOX CAR END, DESIGN AND STRENGTH.—When existing box car ends need renewal they should be reinforced between corner posts with the equivalent of two steel braces, each having a section modulus of 4, or more. These braces may be applied vertically, horizontally or diagonally. New cars should have steel plate ends ¼ 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 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 12½, and wood lining 1¾ in. thick. To concentrate strength at a point near floor line on the vertical centre line of car, diagonal braces should extend from the centre 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. Hardwood or yellow pine may be considered equivalent to the steel members, if the section modulus is four times as great. Wooden posts and braces should be set in metal pockets not less than 1½ in. deep, and must be held in place by adequate tie rods. 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., 9.6; three 4 in. I beams, 9.5 lb. per ft., 10.2; and three 3 in. Z bars, 14.2 lb. per ft., 10.3.

Types of end similar to VanDorn ends, made of ¼ in. plate, or Murphy ends, with the lower half made of ¼ in. corrugated plate, and the upper half with 3-16 in. corrugated plate, may be substituted for those described.

CAR DOORS AND FASTENINGS.—Attention has been directed to non-uniformity of doors and fastenings, and ease with which some cars can be entered without breaking the seal. It was also stated that if car is equipped with a board roof only, this is

partly removed and afterward replaced, and should there be a tin roof underneath, this is cut and bent back sufficiently for a man to enter. After pilferage is committed he returns through the opening, replaces the metal and boards, and an ordinary inspection does not detect how entrance was effected. Attention has also been directed to the large percentage of defective doors, which have to be cleated to hold them in proper position.

Your committee feels that one of the most important parts of the car door proposition, at present, is to reinforce the doors and door fastenings on some existing box cars in the least expensive manner that will make them safe and serviceable. In many cases this does not require new doors, but only additional fittings or reinforcements. For this reason it is thought advisable to make one recommendation to cover the betterment of existing construction, and another to cover all new construction. On account of the patent situation, your committee does not feel that it is feasible to present full detailed designs of doors and fastenings without eliminating some of the best known construction, and, therefore, prefers to present its recommendations in specification form, as follows:

Specifications for reinforcing existing doors:—The necessary additional number of bottom door guides should be provided to make four on each side of the car—one adjacent to each door post, one in the middle of the doorway, and the other between the back door post and the open door stop, located approximately as shown in the illustration, and similar in design, with particular reference to the height of lip, which should be 1¾ in. If the design of the door is such that the removal of the door guide next to the door post would permit the door to be pulled away from the car, then this door guide should be of such design that it cannot be removed when the door is closed.

Doors should be reinforced against bulging by the equivalent of two 1½ by 1½ by 3-16 in. angles extending horizontally the full width of the door, one located approximately 12 ins. from the top of the door, and the other approximately 12 ins. from the bottom of the door, and fastened with ¾ in. carriage bolts.

The door hasp fastener should be at least 24 ins. long, fastened with not less than five ¾ in. bolts with the nuts on the inside of the door. The door hasp fastener should be of such design that the hasp cannot be removed without removing the bolts from the fastener.

The closed door stop should have two or more lips extending at least 1½ in. over the door to support the door against bulging outward. Where all wood closed door stops are used, they should be strengthened against splitting, and should have at least two metal reinforcing brackets similar to closed door stop casting shown in the illustration.

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

SPECIFICATIONS FOR COMPLETE new doors for existing cars or for new construction.—The upper door track should be continuous, and strong enough so that it will not sag, securely fastened to the car with ½ in. bolts, or ¾ in. rivets not less than six in number, and so designed that it will continuously support the door against outward pressure independent of any action of the door hangers, and will also keep out rain and snow, proper flashing, if necessary, to be provided over the door track. The design of track and hangers should be such that when the door is being opened or closed it cannot lift up and bind against the track.

Bottom door guides to have $1\frac{3}{4}$ in. lip, and to be four in number—one located adjacent to each door post, one in the middle of the doorway, and one between the back door post and the open door stop, located approximately as shown in the illustration, and similar in design, with particular reference to the height of lip, which should be $1\frac{3}{4}$ in. If the design of the door is such that the removal of the door guide next to the open door post would permit the door to be pulled away from the car, then this door guide should be of such design that it cannot be removed when the door is closed.

Metal open door stops are recommended, one or more in number, of design shown

door against outward pressure, either continuously from top to bottom, or by the use of two or more lips projecting at least $1\frac{1}{2}$ in. over the door, approximately as shown in the illustration. If wooden closed door stops are used, they must be strengthened against splitting and must be provided with at least two metal closed door stops provided with lips to project over the door at least $1\frac{1}{2}$ in. to support the door against bulging outward, as shown in the illustration.

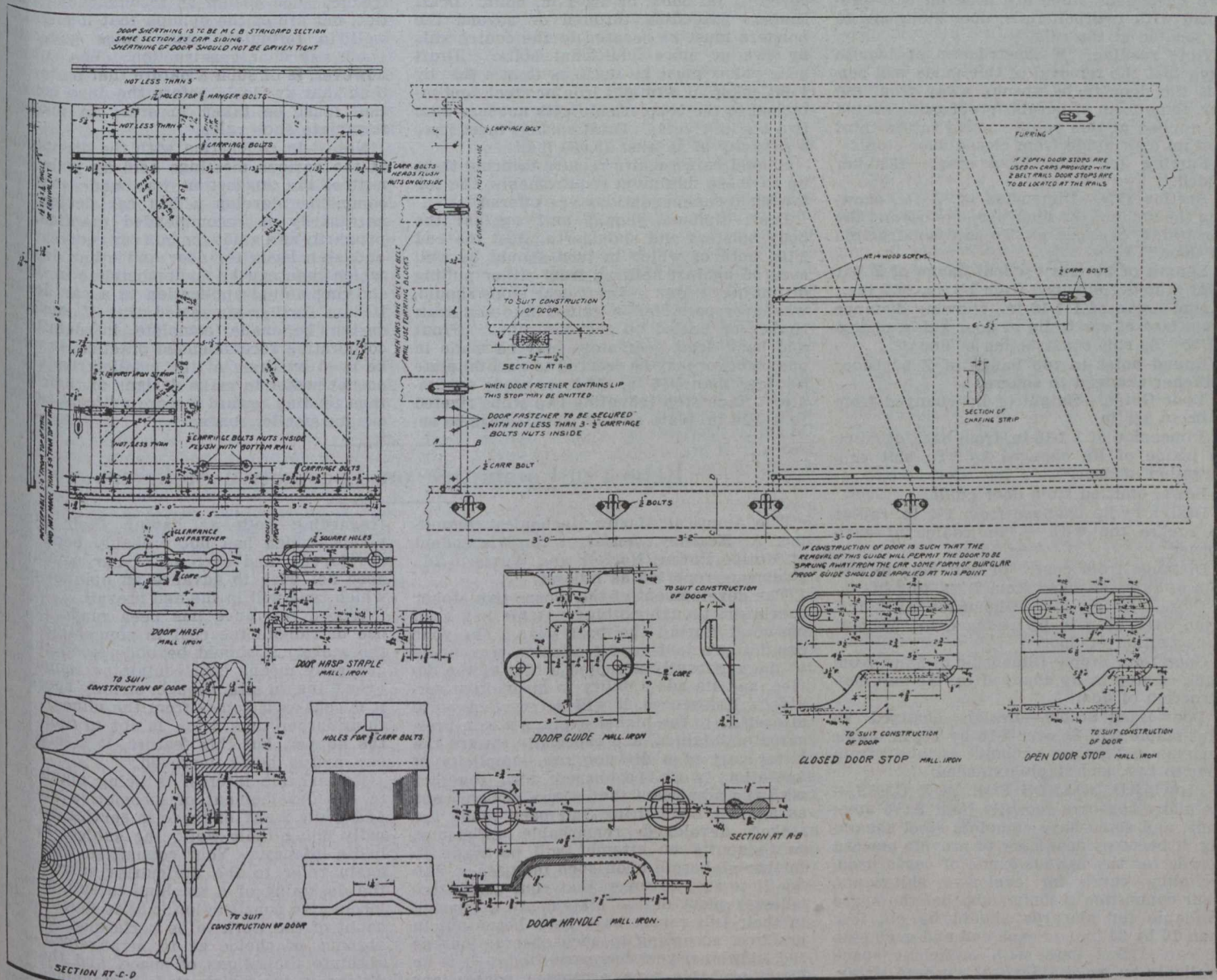
Wood doors should have preferably a metal frame, with a Z bar or its equivalent at the bottom, approximately as shown in the illustration, the Z bar acting as a stiffener and also engaging with the bottom door

Door hanger bolts to be located not closer together than 4 ins. one way, and 5 ins. the other. Four $\frac{3}{8}$ in. bolts are recommended.

It is understood that all of the above recommendations apply particularly to 6 ft. door openings of cars with single, outside hung side doors, and in all cases where a particular construction is described or specific dimensions are given, their equivalents will be acceptable.

The changes of the proposed revision of sheet M. C. B. 30 are all shown in the accompanying illustration, and are as follows:

GENERAL DRAWING OF DOOR.—Construction of door has been changed to show stiles extending full height of door. Four



Car Door Construction, Revised Sheet M.C.B. 30.

in the illustration, securely bolted to the framing of the car with $\frac{1}{2}$ in. bolts. If wood open door stop is used, it should extend the entire height of the door and be strengthened against splitting.

The back edge of the door and the back door post should be so constructed that when the door is closed and fastened it will be continuously supported from top to bottom against outward pressure, and will also be protected against leakage of rain or snow and admission of sparks.

Closed door stop to be preferably of metal, and to provide protection against leakage of rain or snow and admission of sparks. The closed door stop must also support the

guides. This construction or its equivalent permits the use of door guides which project a very short distance from the side of the car, and are, therefore, less subject to injury, particularly the door guide at the middle of the doorway.

Wooden frame doors, if used, should be at least as strong as that shown in the illustration.

The door hasp fastener should be at least 24 ins. long, fastened with not less than five $\frac{3}{8}$ in. bolts, with nuts on the inside of the door. The door hasp fastener should be of such design that the hasp cannot be removed without removing the bolts from the fastener.

holes for door hanger bolts instead of three. 7-16 in. holes for door hanger bolts instead of 9-16 in. Horizontal spacing of door hanger bolts from 6 in. centres to not less than 5 ins. Vertical spacing of door hanger bolts from 4 ins. to not less than 4 ins. Size of door stiffener angle from $1\frac{1}{4}$ by $1\frac{1}{4}$ by 3-16 in. to $1\frac{1}{2}$ by $1\frac{1}{2}$ by 3-16 in. The three no. 14 wood screws in centre of door stiffener angle changed to $\frac{3}{8}$ in. carriage bolts. 3-16 by $1\frac{1}{2}$ in. wrought iron strap added to door hasp fastener. $\frac{1}{2}$ in. carriage bolt added to top and bottom of wooden closed door stop to prevent splitting.

Note reading, "When door fastener contains lip, this stop may be omitted," added

for lower malleable iron closed door stop.

Dimension 2 ins., showing thickness of closed door stop, and dimension $\frac{1}{4}$ in., showing the amount the floor projects beyond the sheathing, both changed to "to suit construction of door."

Note reading, "There must be not less than two bottom door-guide brackets supporting the door in any position, and not less than three bottom door guide brackets supporting the door in the closed position," removed.

Note reading, "When cars are provided with two belt rails, door stops are to be located at the rails," changed to read, "If two open door stops are used on cars provided with two belt rails, door stops are to be located at the rails."

Note reading, "If construction of door is such that the removal of this guide will permit the door to be sprung away from the car, some form of burglar proof guide should be applied at this point," added to the third bottom door guide from closed door stop.

Furring for door hasp staple fastener added.

Section C-D.—Dimension of $\frac{1}{4}$ in., showing the amount the floor projects beyond the sheathing, changed to "To suit construction of door."

Length of bottom vertical flange of Z bar door stiffener changed from $1\frac{1}{4}$ in. to 2 ins.

Dimension of 1 1-16 in., showing distance from face of car to lip of door guide, changed to "To suit construction of door."

Round holes in top flange of Z bar door stiffener changed to square.

Door Guide.—Height of lip changed from 1 in. to $1\frac{3}{4}$ in.

Dimension of 1 1-16 in. from back of guide to inside of lip changed to "To suit construction of door."

Dowel omitted from door guide.

Design of lip changed from $1\frac{3}{4}$ in. radius to square top with $\frac{1}{4}$ in. radius at each corner.

Distance from centre of bolt hole to bottom of guide changed from 2 ins. to 3 ins.

Closed Door Stop.—Dimension of 2 ins. from back stop to lip changed to "To suit construction of door."

Open Door Stop.—Dimension of 2 ins. from back of stop to lip changed to "To suit construction of door."

Door Hasp Staple.—Design changed so that staple will fit over 3-16 by $1\frac{1}{2}$ in. staple fastener. Number of bolts reduced from four to two, and staple extended.

PLACARD BOARDS FOR BOX CARS.—As many box cars recently built have steel ends, and some have complete steel sheathing, it becomes necessary to provide placard boards for the various kinds of cards used, including cards for explosive shipments. Your committee recommends that the space available for placards should be not less than 16 by 24 ins. on each end and each side of car. Box cars with sufficient space available on wood siding, or exposed lining, should have a rectangular space, painted black, on each side and each end. Other box cars should be provided with placard boards, made of soft wood, not less than 16 by 24 by 1 in., the vertical edge reinforced with metal protection, and the bolts fastening the boards to the car not less than six, passing through the metal reinforcing pieces, three through each. The boards may be made of more than one piece, and should then be tongued and grooved. The distance from the floor line of car to bottom of board should not be less than $4\frac{1}{2}$ ft. Routing card boards, preferably the same size as the placard boards described, should be placed on the side of the car, as near as possible to the door seal.

DRAFT GEAR.—There are many failures due to weak draft gears, creating unneces-

sary delays, transfer of loads, excessive cost of repairs, accidents and wrecks. The situation in connection with wooden cars was described as serious. Your committee recommends that cars should not be accepted in interchange unless equipped with draft gears and attachments having strength or capacity equivalent to or greater than the following requirements:

The section area of draft timbers located underneath the centre sills must be not less than 32 sq. ins. Each draft timber must be not less than 4 ins. wide, nor less than 6 ins. deep, and must be held securely to the centre sills and end sills by not less than seven $\frac{7}{8}$ in. bolts, or six 1 in. bolts. Draft timbers extending through or beyond the bolsters must be secured to the centre sills by two or more additional bolts. Draft gear yokes must be not less than 4 ins. by 1 in., made of wrought iron or steel, and attached to the coupler side with not less than two $1\frac{1}{8}$ in. rivets. Draft springs must have a capacity of at least 19,000 lbs.

Should cars require repairs to bring them up to these minimum requirements, the following recommendations are offered:

Draft timbers should butt against the body bolsters and shoulder against the end sills, both of which in turn should be well secured against shifting from either pulling or buffing strains. Draft gear stops should, whenever possible, be gained into the draft timber or heeled on the end sills. Front and back draft gear stops may be made in one piece, or may be secured to a metal plate not less than 5-16 in. thick, or made separate. Each stop (counting two stops riveted to a 5-16 in. plate as one piece) must be se-

cured to the draft sill by not less than six $\frac{3}{4}$ in. bolts or their equivalent. The centre sills should be strengthened by the use of a filling or packing piece secured between the same, butting against the end sill and extending beyond the body bolster toward the centre of the car, a distance at least as much as between the bolster and end sill. The present M. C. B. coupler side clearance of $2\frac{1}{2}$ ins. should also be provided.

STOCK CAR DOORS.—It was suggested that a design of door be submitted for recommended practice as a guide for application of such doors. Your committee has agreed that at present it would not be policy to introduce such design as recommended practice, but are of the opinion that it might be well to formulate some rules governing stock car door construction. The subject, however, is of such a nature that more time than that available before the June convention must be taken in order to properly formulate such rules.

Note.—In connection with the discussions at the various meetings held by your committee, the suggestion was made that the committee develop a box car design, not necessarily as recommended practice, but primarily as a guide for box car construction, and as a basis for door and other designs, which then can be made complete in detail, showing actual application to a car design. It was further suggested that if such car design be made complete in detail, incorporating recommended practice, it would be used by some of the smaller roads who do not prefer to make designs of their own, thus tending toward a more uniform type of car for smaller roads.

Report of Committee on Locomotive Stokers.

The American Master Mechanics' committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Rd., chairman, reported as follows:

The development of the locomotive stoker continues, though nothing notable has been observed during the past year. In your committee's last report allusion was made to the apparently accepted utility of the device, and its adaptability to locomotive service. References, it will be recalled, were also made to the higher average steam pressures maintained, and especially toward the latter part of a division run, simplicity of operation, work performed, etc., together with the admission that where comparisons as against hand firing had been made the stoker developed remarkable efficiency, consequently no attempt will be made to further elaborate upon such features. Suffice it to say, however, that your committee believes most of the statements appearing in their last report have been borne out in practice, according to such observations as the additional year has permitted. It is no doubt probable some erroneous conclusions have been drawn with reference to the capacity of the stoker, relative fuel consumption and economy, before fully weighing all operating conditions in train service. A truer value of the stoker and its range of usefulness and efficiency seems to be fully comprehended by those who have taken the time to make the necessary inquiries and investigation.

In your committee's last report an effort was made to give a comprehensive idea of the development of the locomotive stoker and the lines along which the inventors are apparently working. It was pointed out that the several types were in the main divided into two general classes, namely, the underfeed and the scatter or overfeed types. No attempt was made to venture an opinion as to which type was the better

(regarding both as having their strong points, which had not probably been fully developed), and even now your committee does not wish to advance an opinion as to which type will in the end prevail.

Where reference has been made to the use of run-of-mine coal in connection with the stoker, it should be understood that it generally means coal containing lumps not over 6 ins. in size, though, strictly speaking, it is coal as it comes from the mines. Anything larger than 6 ins. is apt to arch over the hopper, but this feature, it is claimed, can, and is, being improved.

Remarkable interest is being manifested in the development of locomotive stokers, and while many of those in service are actually doing their work, the subject is still in its infancy. Your committee wishes to again refer to the difficulties surrounding the designing of a machine to suit present locomotive construction; not so much on account of the work to be performed, but the absence of choice as to arrangement, the absolute limitations of space, and the conditions under which such a machine must operate. It is believed that as time goes on, greater latitude will be given the designers, and consequently more will be accomplished, where it is preconcided that the stoker is to be a part of the locomotive. This should allow consideration being given to the working parts of the stoker along with the locomotive as a whole, and it is not improbable that when the design for the stoker is given equal consideration the locomotive will be constructed in many of its details so as to better suit, or be better adapted to, a stoker than now obtains where it is necessary to construct the stoker to suit existing designs.

THE STREET STOKER, which is of the scatter type, and a type having the greatest number in service (totaling 418, with some 82 on order), as now designed, handles

crushed or slack coal. Some of the earlier designs, however, were constructed to handle run-of-mine coal. A number of these stokers are still in operation on passenger locomotives on the Chesapeake and Ohio Ry. The tabulation shown as a part of this report is sufficient evidence that the locomotives so equipped are coming and going daily (many in pool service), performing the work expected of them, and the proper operation of the stokers with which the locomotives are equipped is left to the crews to which they are assigned. A better idea of the service and failures may be obtained from the tabulation.

CRAWFORD STOKER.—Beyond the continued improvement in detail parts, the Crawford underfeed stoker seems to be adhering closely to its original principle of construction. The record shows that there are at present 301 in service, all applied to locomotives on the Pennsylvania Lines West of Pittsburg, except two on the Pennsylvania Lines East of Pittsburg. From all reports they are working satisfactorily. The machine, as previously described, handles run-of-mine coal, producing its best results using the higher volatile products. The report from the Pennsylvania Rd. is to the effect that they are closely observing the everyday performance of the stokers in service, so as to ascertain under which the highest efficiency is obtained, and incidentally are educating men to handle and control them to the best advantage.

THE HANNA STOKER is another of the scatter type, but handles run-of-mine coal, as described in detail in last year's report. It continues to perform its work satisfactorily, according to reports. The records show that to date there are three in operation—one on a Mallet locomotive on the Carolina, Clinchfield and Ohio; another on a mikado on the Queen and Crescent, and the third on a class M2 (4-8-0 type) locomotive on the Norfolk and Western.

We are informed that there are six additional stokers to be applied to Mallet locomotives on the Carolina, Clinchfield and Ohio, and 15 to the same type locomotive on the Norfolk and Western.

STANDARD STOKER.—Your committee's last report mentioned all stokers concerning the operation of which information had been secured. Since that time some tests of the Standard stoker have been made on the New York Central Lines, in heavy freight service, and the reports so far seem to be quite promising. The company manufacturing the stoker, like other designers, seems to be satisfied that it is working along the right lines, and such may be the case, but time and trial only can determine if it is right. A special feature claimed for the stoker is the elimination of all parts from the engine cab and deck, and the use of run-of-mine coal without previous treatment or selection. The coal is reduced to the required size by an arrangement of the feeding screw, thus eliminating the necessity of a separate crusher.

As the coal gravitates to the horizontal screws it is delivered to a point about the centre of the firebox—but at the back end—where another screw, in a vertical position, elevates the fuel to a sufficient height, where it is blown by steam over the fire bed. The machine is actuated by a turbine engine, which is also a departure from the conventional lines followed in other designs. A second stoker of the Standard type has been put on a Mallet locomotive in service on the New York Central, and three more have been secured for experimental purposes on the Norfolk and Western. Two of the latter machines will be applied to heavy freight locomotives of the 4-8-0 type, and the third to a heavy passenger locomotive. The Standard stoker, like the Hanna and Crawford, differs from

the Street in that it handles run-of-mine coal, whereas the Street, as now constructed, requires prepared or slack fuel.

AYERS STOKER.—Within the past year some very interesting work has been done by A. R. Ayers, General Mechanical Engineer of the Lake Shore and Michigan Southern, toward the utilization of the chain grate, as we understand it. Your committee is not familiar with the details of the design, nor the progress thus far made, but understands it is not quite ready for application. The idea indeed is interesting, and is a principle your committee believes well worth exploiting. The Standard and Ayers, if we may so designate the latter, seem to represent the most prominent work in the stoker field during the past year.

BREWSTER STOKER.—No reports of further development of this stoker have been received during the year. The statement has been made that its patents have been taken up by the Standard Stoker Co.

STROUSE STOKER.—While nothing definite has been learned concerning any new developments in this stoker during the past year, it has been said that a son of the original inventor is working on the design.

GEE STOKER.—But one stoker of this design has been built to date. It is still in service on a class H-6 (2-8-0) locomotive on the Pennsylvania Lines East, and is reported as giving good results. It is still considered in an experimental stage.

ELVIN STOKER.—With the construction of a full size working model of this stoker, which is now ready for application, a distinctly new principle is offered. While it properly belongs to the "scatter" or "overfeed" group, it may be referred to as the shovel type in contradistinction to the rest. The machine is attached to a casting similar to, and is bolted to, the back head of the boiler—the same manner as the fire door front. It is made up of two shovels, one operating to the right and the other to the left; under full control, distributing coal regularly and evenly over the bed of the fire, as might be expected under expert hand firing. The drum, or stoker mechanism, operates at 20 r.p.m., when shoveling 12,000 lbs. of coal per hour. The operation is entirely mechanical, no steam being used in distributing the coal.

THE RAIT STOKER is a patent of G. B. Rait, of Minneapolis. Your committee has not seen any working drawings, but understands from the inventor that most of the machinery is below the deck of cab. It is also mentioned as an interesting feature that it can be handled as either an underfeed or a scatter type. As yet there is none in operation. We further understand from the inventor that he has some new designs and improvements pending in the Patent Office, and will soon have working drawings ready for exhibition. This stoker is therefore undergoing development.

BARNUM, DICKERSON, ERIE, HAYDEN, Hayden modified, McMullen, Harvey, Hervey and Kincaid.—It cannot be ascertained that there are any of these stokers in service, or that anything has developed concerning them during the past year.

The Norfolk and Western Ry. submits the following performance figures for the Street stoker: All failures chargeable to stokers: Machinery failures in fair service, 43; failures due to flaws and defects in machinery, 4; failures due to machine becoming clogged with foreign matter, 31; shop or bad-workmanship failures, 19, crew failures, or failures due to improper handling, resulting in low steam, 48; failures due to improper lubrication as a lack of attention, 20; total failures, 165; total mileage made by locomotives equipped with stokers, 2,296,803; total stoker failures as above, 165; miles per stoker failure, 13,920; total cost for labor

and material chargeable to stokers, \$12,179.22; and cost of stoker repairs per 100 miles, cents, 0.53. Locomotives 1303 and 1311 have not as yet had a stoker failure charged to them, having made 36,089 miles and 35,778 miles, respectively, since the locomotives were put in service new in April, 1912.

The Baltimore and Ohio Rd. reports that the Street stokers in service on that road are making 44,300 miles per failure chargeable to the stoker proper. It may be of interest to mention in connection with the apparent difference in the figures submitted by the Baltimore and Ohio and the Norfolk and Western showing mileage per stoker failure, that the Baltimore and Ohio figures are computed on the basis of the number of machinery failures in fair service and does not include delays caused by the stoker not being properly operated by the engine crews. On the same basis, as can be quickly seen by referring to the tabulation, the mileage per failure on the Norfolk and Western would be equal to 53,414 miles, which is very close.

The following data are submitted by the Pennsylvania Lines West, giving some interesting information in connection with the performance of the Crawford stoker, including all trips of all stokers from the experimental installation to this date:

	As reported Jan. 1913.	As reported Jan. 1914.
Total no. of trips	26,693	98,181
No. of trips—100%	16,445	55,913
" of trips—98%	262	335
" of trips—95-98%	402	723
" of trips—90-95%	1,367	3,865
" of trips—85-90%	1,577	5,352
" of trips—80-85%	560	1,861
" of trips—75-80%	715	2,963
" of trips—70-75%	962	4,086
" of trips below 70%	305	1,306
" of trips below 70%	4,098	21,787

The Norfolk and Western submits the following data for the Hanna stoker: Put in service, Feb. 11, 1914; days in service, 48; trips, 37; 100% or successful trips, 32, or 86%; and failures on road requiring hand firing for a portion or completion of trip to be made pending repairs to be made, 5.

During 1912 there were 165 Street stokers in operation. During 1913 there were 253 additional stokers installed, making a total of 418 in operation. They are distributed as follows:

ROAD.	Consolidation.	Mallet.	Mikado.	Mountain pass.	Decapod.	Centipede.	Pac. pass.	Total.
L. S. & M. S.	3							3
N. & W.	2	90						92
C. & O.	1	14	50					64
E. & O.	1	24	161		1			187
Virginian		6	1					7
B. R. & P.		5	1					6
H. V.			17					17
A. T. & S. F.		1						1
D. M. & N.		8						8
E. P. & S. W.	1		5					6
C. B. & Q.			1		12			13
Erie						1		1
Total	4	155	236	3	13	1	6	418

During 1912 the Pennsylvania Rd. Lines West of Pittsburg had 153 double underfeed Crawford stokers in operation. The Pennsylvania Lines East of Pittsburg had 2, making a total of 146. During 1913, 155 additional stokers were applied, making a total of 301:

Type of stoker.	Class of locomotives.	Reported Jan. 1913.	Reported Jan. 1914.
12	K2	1	1
12	K2as	26	26
12	K3s		30
13	H3c	10	10
13	H3cs	1	1
14	H6a	5	5
15	H6a-b	20	20
16	H6a	1	1
17	H3c	1	1
19	B29	1	1
22	H3c	54	54

22	H8cs	32	32
22	H10s	..	110
23	H6a-b	1	2
25	K2	..	4
25	K2as	2	3
Total—		155	301

SUMMARY.

Type of Stoker.	No. of stokers in service.	No. of stokers on order.
Street	418	82
Crawford	301	..
Hanna	3	21
Standard	2	3
Gee	1	..
Ayers	1	..

Stokers under development—none yet applied: Strouse, Elvin, Rait, Brewster, and McMullen.

Stokers for which there is no advice of further development: Barnum, Dickerson, Erie, Hayden, Hayden modified, Harvey, Hervey, and Kincaid.

During the past year opportunities have been afforded to observe a much larger number of stokers in service, many of them working in pool runs, which rather strengthens the belief that they are capable of going along, faring under the usual average attention given a locomotive, without developing prominent or serious defects that result in materially increasing terminal turning time. The most natural inquiry would refer to the durability of such machines as a whole. It goes without saying that the stoker, with all of its parts, is susceptible to wear, but those in service have no doubt surpassed the general expectation. They require attention and repairs, but the cost figures are not excessive, considering the stage of development through which they are passing. There is no particular work the fireman can do in the way of making repairs on the read, but attention on his part, though slight as a rule, is beneficial and helpful toward preventing failures. The performance of the stokers in service during the past year has served to show what must be met in the way of durability, and what is necessary to withstand the operating strain. Alterations are now in progress looking toward stronger and more durable machines, which should in turn favorably affect the cost of maintenance.

It is noteworthy that when the demands upon the boiler are fairly uniform, permitting a regular feed of coal, the operation of the stoker practically takes care of itself, but, in the absence of automatic manipulation, manual control does not always result in efficient regulation of the fire; on the contrary, the boiler, if anything, is allowed to blow off more than necessary, not only under working conditions, but quite freely when the demands are reduced, and when the locomotive is not using steam, carrying with it some waste of fuel, due, however, to want of attention. Then, again, there is some tendency, through neglect, to allow the fire to get low while standing on the road, making rebuilding necessary; still with the stoker the fire is readily revived, and little, if any, time is lost thereby.

It is still a moot question as to whether it is economical to use run of mine or screened coal. Both schemes are worthy of consideration, depending upon local conditions, and in the same way that it is necessary a road contemplating the use of stokers can only work out the advantages to be gained after taking into consideration the physical character of the road, the size of locomotives, and the tonnage now being handled, it should ascertain whether upon taking into account all local conditions it is more profitable to use the screened or run of mine coal.

As for fuel consumption, it has been pretty clearly shown that the amount of coal used by the stoker (as to some extent obtains in hand firing) largely depends upon the physi-

cal character of fuel rather than the heat value, so long as the latter is within a reasonable range. The establishment of data to show the relative fuel consumption by hand firing as compared with the operation of the stoker was sought, but so far there seems to be very little statistical information in such shape as to permit a general ready comparison to be made. At the same time some very complete tests have been conducted under a range of operating conditions, character of fuel, etc., but none of them permit conclusions to be drawn without taking into consideration the character of fuel and conditions under which the highest efficiency was obtained. In order to make a true comparison, therefore, it is necessary to ascertain and fully account for local conditions, character and price of fuel.

The year's experience seems to give color to the belief that the stoker is not necessarily a coal saving device, but that its advantages tend in other directions. Dynamometer tests have shown that the capacity of the locomotive is increased, and according to further reports made by the Pennsylvania Rd. an increase approximating 5% in trainload with the Crawford stoker for an equal amount of fuel hand fired has been obtained. The Baltimore and Ohio reports an increase in train tonnage from 5 to 10%. In both, however, it should be remembered that the differences indicating increased capacity were largely dependent upon local conditions. The Hocking Valley advises, in connection with the Street stoker, that it is using fuel known in the Hocking Valley district as "coarse slack." It is coal that passes through a $\frac{3}{4}$ in. mesh screen. As for fuel consumption, the Hocking Valley reports that no definite tests have been made, adding, however, that their fuel record showing consumption of coal per locomotive per 1000 miles does not indicate there has been any reduction in fuel per 1000 ton miles, but that the grade of coal used is purchased at about 40% less than run of mine.

In tests made on the Norfolk and Western, it was found with one of the scatter type stokers that there was a considerable increase in coal consumption using Pocahontas slack as compared with Pocahontas run of mine hand fired. The difference in quantity of coal consumed as between screened coal stoker fired and run of mine hand fired was found to diminish as the physical character approached the run of mine, or a product containing a less amount of fine material. While standing along the road it is quite necessary, as can be readily appreciated, to occasionally watch the fire in order to keep it in proper condition and in readiness, especially where slack fuel is used, as the depth of the fire is relatively lighter, but it is not materially unlike what is needed for efficient and economical hand firing.

As referred to in another part of this report, the fuel consumption seems to vary almost in proportion to the physical fineness of the coal used in stoker firing with the scatter type machines, a percentage of the lighter material being evidently drawn through the tubes by the heavy action of the draft. Using Pocahontas nut stoker fired and run of mine hand firing, the consumption figures are not far apart. From this it would appear that with the higher volatile coals containing a smaller amount of fine product, the consumption of fuel as between hand fired and stoker fired should be very close. It also seems evident that though the consumption increases as the coal becomes finer in character, the stoker is better able to maintain steam with it than might be secured on an average hand fired.

With reference to the emission of smoke: It was mentioned in your committee's last year report in substance that, as combustion is improved in stoker firing as against

irregular hand firing, there should be some diminution in smoke. Some observers have reported that with a thin fire and conditions otherwise favorable, stoker firing, as with hand firing well executed, little objectionable smoke is emitted, but as the difference in the range of operating conditions and character of fuel are usually so large, a liberal view must be taken of what might be expected. Your committee has not had the opportunity to make extensive investigations, but has received reports that when the feeds are not forced beyond the limits of complete combustion, the reduction in smoke is longer maintained with the underfeed than with the scatter types, on account of the fuel being delivered up through the bed of the fire as combustion progresses, under conditions of service and character of fuel suitable to their present stage of development.

Following the presentation of our last year's report on this subject, some very interesting remarks were made with reference to contemplated experiments with pulverized fuel on locomotives. Several industrial plants have made installations of furnaces for the utilization of powdered fuel, and the report is that satisfactory results are being obtained. It is also understood that the New York Central has made some investigations in connection with the use of such fuel on switching locomotives, and it is still investigating the subject, but up to the present time it is quite experimental. The Pennsylvania has also given it some consideration, but advises it has nothing of interest to offer.

Report of Committee on Tank Cars.

The Master Car Builders' Committee, A. W. Gibbs, Chief Mechanical Engineer, Pennsylvania Lines, chairman, reported in part as follows:

The most important question presented to the committee has been the question of the continued use in transportation service of the old tanks, originally on wooden underframes. At the time the tank car specifications were first drawn, in 1903, the greater part of the tank car equipment came in this class. While some action was urgently required at that time to improve the situation, it was necessary for the committee to be as lenient as safety would permit in the treatment of the then existing cars, and, consequently, the specification for tank cars having wooden underframes was drawn with very mild minimum requirements, among them the provision that the tanks should be tested to but 40 lbs. pressure, which they must stand without leakage. At the same time, however, specifications were made for tank cars built subsequent to that date, requiring steel underframes, and tanks designed for a bursting pressure of 240 lbs. and a test pressure of 60 lbs. per sq. in. Cars built with this specification are now very largely in use, particularly in handling inflammables.

Service having proved destructive to wooden underframe tank cars, owners have been ordering steel underframes, to which to transfer the old tanks. Several of these old tanks have involved the railways in very heavy losses from leakage of contents, due to cracking of the sheets, particularly the heads, probably due to punishment received from the head blocks. Complaints have also been received of a number of very bad tanks developing leakage on the road.

In considering whether old tanks transferred to new steel underframes should not be put on the same basis as tank cars built after 1903, viz., required to stand the 60 lbs. test pressure, some of the owners considered that this would be an unnecessary hardship, and proposals were even made to lower

the test pressure to 20 lbs. Yard tests made of an old condemned tank showed that a tank which would stand 20 lbs. water pressure without leaking would withstand the shock acquired in transportation when filled with a liquid of the same viscosity as water. Notwithstanding this, your committee feels that it is unwise to permit the unrestricted transfer of old tanks to steel underframes, especially where they are to carry inflammables, such as the gasolines. Tanks are running which are known to be more than 35 years old, and as the tank car specification has been in existence 10 years, it would seem that any tank on wooden underframe has already given a reasonable life.

It is felt that there should be a distinction between cars carrying inflammables and those carrying other products not involving the safety question; that the interval between the hydraulic tests should be shorter

as the age of the tank increases; and that definite provision should be made in the specification for the retirement from transportation service of tanks which cannot meet the test requirements.

In many cases, the pressure tests have not been made by filling the tanks with cold water as prescribed, in some cases air pressure having been used, or hot water, or even steam. It is felt that such tests do not meet the spirit of the specification, and do not insure the detection of the leaks as the cold water pressure does.

It is felt that frangible lead discs, used in connection with the safety vents, as an alternative to the safety valves on cars carrying non-inflammable products may be safely excepted from the requirements of periodical test, as the test could only develop the bursting pressure of the particular disc tested, which would then be replaced by a new disc, not tested.

inspectors are located at a point from which empty cars are distributed to stations the inspection will be made and certificates attached at that point. This inspection will be confirmed by agent at loading point. In all other cases the agent at loading point should inspect the car and file certificates as shown.

Aside from the Master Car Builders' inspection of car, including roof, running boards, air brakes, safety appliances and running gear, as well as the external inspection of sides, ends, doors, ventilators and windows, before inspection certificate is issued, an internal inspection must be made. Search for loose, damaged and broken boards, loose knots, knot holes, bad joints, etc. Search for all nails, spikes, screws and bolts extending above surface of floor and lining and nails protruding through roofing. Search for water stains indicating cracks and air spaces. Examine for metal sheets out of position along edge of sub-carline or down from edge of ridge pole. Doors must open and close properly. Inspect closely for defects in framing which might, by reason of their weakness, allow the sheathing to readily be broken or damaged. Close doors, ventilators and windows and search for light indicating openings and cracks which might produce leaks. Search for cracks sufficient to admit storm water beating through opening; also for openings and bad joints around windows and doors.

When a car is loaded by a shipper the inspection certificates must be detached from the car and delivered to agent before bill of lading is issued. All certificates finally must be filed by the agent at point of loading for future reference.

Report of Committee on Overhead Inspection of Box Cars.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., chairman, reported as follows:—

Following the procedure indicated last June, your committee, when it was called upon by the American Railway Association sub-committee, explained to them in detail the code of rules for the overhead inspection of box cars, formulated at their suggestion. The proposed code was gone over with the American Railway Association committee, studied at length, and several changes were made, without, however, disturbing its general plan or principle. The code, as finally accepted by the American Railway Association committee, was submitted to the executive committee of that Association, and was later laid before the American Railway Association at its semi-annual conference, in Chicago, in Nov., 1913. Your committee has advice that the report and code of rules alluded to, were accepted by the American Railway Association, and were proposed as a recommended practice. It is the understanding of your committee that the railways will, through the American Railway Association, be asked to give the project a thorough trial. Your committee wishes to ask that should the proposition be given a thorough trial by any railways desiring to take hold of the work along the lines indicated in the committee's report, and objections are found (as doubtless there will be), the circumstances shall be fully explained to the committee, so that the card or code may be improved in detail, rather than set them to one side as a whole, should they not perhaps meet certain local conditions. They believe such a course will be more effective and will enable them, if possible, to more quickly determine desirable practices. Your committee, in making this explanation of the status of the work, also wishes to advise it is their understanding that their work is now at an end temporarily, that is, until some report is made pointing out needed alterations in the card or code.

It has occurred to your committee that through some cars not completely reaching the requirements of the code, an opportunity will be offered for a careful check of same, which will readily indicate the additional repairs necessary and at the same time enable railways to compute the cost that will be entailed to reach the physical condition indicated by the card or afford an opportunity to ascertain wherein the requirements are too severe. No railway can do very much alone; on the contrary, the general condition sought by the use of the card can only be effectively reached through

each road doing its share.

The card and code of instructions, as finally accepted by the American Railway Association as a recommended practice, are as follows:—

INSPECTION AND CERTIFICATION OF BOX CARS BEFORE LOADING WITH FREIGHT SUBJECT TO DAMAGE.

(Recommended Practice subject to such changes as may be required to meet local or special conditions.)

Note.—This inspection does not cover cars for explosives or other dangerous articles provided for by the Regulations of the Bureau of Explosives.

Freight as described below must be loaded in certified cars which have received a special inspection in accordance with the following instructions. If cars pass the special inspection, this will be indicated by an inspection certificate which will be tacked on each side of the car below the car number.

Classification of Equipment Suitable for the Following Freight.

Classification A.—Package freight liable to loss or damage by water, protruding nails, material carrying odors, oil, grease, or moisture on interior of car, especially the floor.

Classification B.—Bulk freight liable to damage by water, or to loss through small openings.

Classification C.—Freight liable to loss or damage by water or protruding nails, but which cannot be lost through small openings.

The face of inspection certificate should be printed as follows:

INSPECTION CERTIFICATE.
NORTH & SOUTH RAILROAD.

Car Initial..... No.....
O. K. for shipment of commodities

Under..... Classification.....

Inspected by.....
Date..... Station.....

On back of card, inspection instructions should be printed as follows:

INSPECT FOR
and see that car is free from following defects:

Classification "A."	Classification "B."	Classification "C."
Leaky roof.	Leaky roof.	Leaky roof.
Loose siding.	Loose siding.	Loose siding.
Loose roof boards.	Loose roof boards.	Loose roof boards.
Shifted roof sheets.	Shifted roof sheets.	Shifted roof sheets.
Broken door stops.	Broken door stops.	Broken door stops.
Leaky doors, tops and sides.	Leaky doors, tops and sides.	Leaky doors, tops and sides.
Broken end posts.	Broken end posts.	Broken end posts.
Broken or loose door posts.	Broken or loose door posts.	Broken or loose door posts.
Protruding nails in floor and lining.	Holes in floor and around center plates and draft bolts.	Protruding nails in floor and lining.
Floors or sides soiled by oil, grease or any material carrying odors likely to damage lading.		

When there are inspectors located at points of loading the inspection will be made and certificates attached at that point. Where

Report of Committee on Specification and Tests of Materials.

The Master Car Builders' Committee, C. D. Young, Engineer of Tests, Pennsylvania Rd., chairman, and of which E. P. Tilt, Engineer of Tests, C. P. R., Montreal, is a member, reported as follows:

Your committee was instructed to revise certain specifications of the Association and prepare new ones covering certain other classes of material covered in the recommendations of last year's committee on form. Specifications covering 16 different classes of material were sent out for criticism by the members and, as a result of these criticisms and subsequent meetings, it was agreed that the following named materials only could be handled this year: Airbrake hose, heat treated knuckle pivot pins, steel axles, refined wrought iron bars, welded pipe, helical springs, chain, and journal box brasses; and that the specifications covering the following materials could be further investigated and specifications offered at the next annual meeting: Refrigerator car heat insulation materials, mild steel bars for miscellaneous parts, steel castings, rivet steel and rivets, structural steel and steel plates, galvanized sheets, malleable iron castings, and elliptic springs.

Your committee has been in correspondence with the Association of Rubber Goods Manufacturers during this year and is co-operating with it in order to establish standard methods of making tests and standard test apparatus, as there are no standards covering the testing work for this class of material in existence today.

The specifications covering air brake and signal hose for passenger and freight equipment cars have been revised, changing the form of the specifications and explaining the methods of test, but the committee has endeavored not to make any changes in the requirements of the specifications other than

those in existence as standard, and as adopted in 1913. Your committee respectfully recommends that the revision of the specifications for air brake and signal hose for passenger and freight equipment cars be made standard; that the specifications for steel axles be adopted as standard, and that the following specifications be submitted to letter ballot as recommended practice: Refined wrought iron bars, heat treated knuckle pivot pins, welded pipe, helical springs, chain, and journal box brasses.

The report was accompanied by recom-

mended specifications for air brake and signal hose for passenger and freight equipment cars, welded pipe for passenger and freight equipment cars, heat treated knuckle pivot pins for passenger and freight equipment cars, steel axles for passenger and freight equipment cars, refined wrought iron bars for passenger and freight equipment cars, helical springs for passenger and freight equipment cars, chain for passenger and freight equipment cars and journal brasses for passenger and freight equipment cars.

mittee did not feel like giving up the advantages dormant in the wedge lock principle, which is applicable to most coupler designs, nor did it desire that a wedge lock coupler be tried in service in general, hence it was decided to make and confine further experiments with this wedge principle under the direct supervision of your committee. 5,000 of each type of coupler was the number agreed upon for the tests.

Report of Committee on Couplers and Draft Rigging.

The Master Car Builders' Committee, R. L. Kleine, Chief Car Inspector, Pennsylvania Rd., chairman, submitted a very complete report, of which the following abstract has been made:

Comparisons show that the experimental couplers reported on last year are much stronger throughout than present types of couplers and that your committee is working along the right lines. This work has been conducted jointly with the coupler manufacturers. A joint committee held numerous meetings to discuss and decide upon details and fundamentals of design, such as operation, contour lines, strength of the various parts, dimensions of knuckle hub and knuckle-pin hole, location of knuckle-pin hole and lock set, height of coupler head, size of shank and type of knuckle thrower, etc. Considerable discussion ensued on these points which are very pertinent to design, each one influencing the other to such an extent that full development or perfection of any one will handicap one or more of the others. The members of the association were invited to make a critical examination of the coupler models and give the committee the benefit of their criticisms and recommendations, at last year's convention.

STATIC TESTS.—A series of static pulling tests consisting of two couplers of each design submitted by the coupler manufacturers and exhibited by your committee was instituted at Altoona shops, Pennsylvania Rd. under the direct supervision of C. D. Young, Engineer of Tests. These tests on these couplers were made by laying the couplers off and measuring both deflection and permanent set after each increment of load and tabulating the distortions by so much plus or minus from the original dimensions. A comparison of permanent set at the knuckle openings shows the committee specification type to have a decreased set of 78.9% at 150,000 lbs., and an increased loading of 94.1% at the M. C. B. limit of set. The total load can be increased 75.5%. This likewise applies to the knuckle stretch, which shows a decreased set at 150,000 lbs. of 98.9%, and an increased ultimate load of 69.5%.

ROAD TESTS were continued, and were conducted with couplers of present type on freight cars and with couplers of both present and the experimental design on freight locomotive tenders on the Pennsylvania Rd. The freight car couplers were applied to 100,000 lbs. capacity steel hopper cars in the coal trade between the bituminous mines in western Pennsylvania and tide-water, a service comprising grade and flat country as well as hump-yard classification. The tender couplers were applied to 7,000 gal. steel tenders in general heavy freight service on the Western Pennsylvania division, between Altoona and Pittsburg, which includes heavy grade service. The road tests of couplers on tenders in freight service develop in the shortest space of time the defects as well as the relative life

of couplers, and it is surprising to note the short life of couplers of the present type in this service, as well as the relatively longer life that is being obtained from the experimental coupler.

SELECTION OF COUPLERS FOR GENERAL TRIAL IN SERVICE.—Coupler manufacturers designed the working parts of the couplers submitted at the last convention, and it was essential to select from these couplers several designs to be tried in service during the ensuing year to definitely determine the best contour line, efficiency of operation and strength of the various parts, with a view of harmonizing the designs thus chosen

HEIGHT OF COUPLER HEAD ABOVE CENTRE LINE.—The following were decided on: The hub of the knuckle shall be 8 ins. high. The height of the coupler head above centre line of coupler shank shall not exceed, for a locomotive coupler, 6 3/4 ins. for a distance of 6 ins. back of coupling line, and for a freight car coupler, 7 1/4 ins. for a distance of 6 ins. back of coupling line; but using same head as for locomotive coupler, the allowable increase (1/2 in.) in height for the freight car coupler is to provide for reinforcement of junction of top coupler ear to coupler head. The head shall not be offset below centre line of coupler shank. The design of the coupler shank shall be the same in both experimental couplers. The weight of the complete couplers, 6 by 8 in. shank, 9 1/2 in. butt, shall not exceed 400 lbs.

THE COUPLER SHANK, 6 BY 8 INS.—design shown by American Steel Foundries was accepted for the present; also that sub-

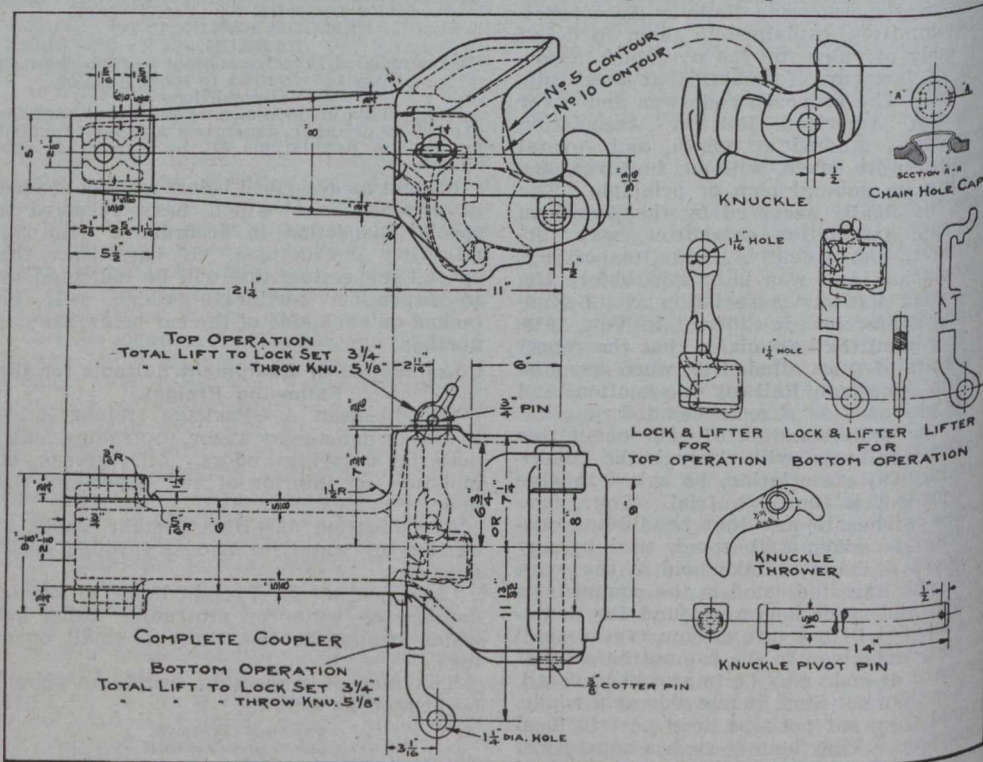


Fig. 1.—Experimental Standard M.C.B. Coupler A.

and eliminating any details that may prove unsatisfactory to the end of establishing the standard coupler. Accordingly, a joint conference was held with the coupler manufacturers.

The nine couplers submitted to your committee as embodying the joint specifications of design and which your committee exhibited at the 1913 convention, were taken to Altoona and mounted on operating racks for the purpose of studying each and to learn the effects of being in the weather. Each coupler submitted was taken up and each minute detail, both of design and operation, was considered and thoroughly discussed, and by carefully weighing all the points at issue it was decided to try two couplers shown in figs. 1 and 2. These couplers have straight locks and were selected for the general trial, but the com-

mitted by the National Malleable Castings Co.

COUPLER BUTT, to be 9 1/2 in., with 1 1/2 in. vertical face for yoke gib, coupler rivet holes and general design same as present M. C. B. standard.

KEY SLOT.—Uniform standard should be adopted.

COUPLER SHANK, 5 BY 7 INS., to be the same as present M. C. B. standard, with the exception of the juncture of the shank to the head, which is to be in accordance with drawings submitted for the representative couplers.

COUPLER BUTT, same as present M. C. B. standard.

KEY SLOT, same as M. C. B. standard.

MARKINGS CAST ON THE TWO TRIAL COUPLERS.—During the trial of the two selected committee specification couplers it will

be necessary to distinguish one from the other, since from the results of the trial either will be adopted as an M. C. B. standard. They are designated types A and B experimental standard M. C. B. coupler. When the trial or experimental period is completed, the word "experimental" will be dropped, leaving the coupler finally selected or adopted as the standard M. C. B. coupler.

KNUCKLE CONTOURS.—While the patterns were being completed it was brought out that the contour back of the pivot pin of the A and B knuckles in either the no. 5 or no. 10 contour was different, as in fig. 3. The contour of the knuckle of any coupler at this point is determined largely by the distance of the locking surface of the knuckle from the horizontal centre line of the coupler, or rather the thickness and relative location of the locking block. The contour of a knuckle at this point, which is the line connecting its locking surface with the main contour of the coupler head near the ears of the bar, directly affects the operations of coupling and uncoupling and hence is very important. Both manufacturers had good arguments in favor of their particular knuckle contours.

It was demonstrated that the A knuckle of no. 5 contour at the higher angles of centre line divergents or curving gave a condition of binding or hooking in uncoupling which was not present in the B knuckle of no. 5 contour, but the A knuckle on a straight track keeps contact slightly longer between its nose and the tail of the mating coupler in coupling than the B knuckle of no. 5 contour. It was agreed that the A knuckle of no. 5 contour is slightly more desirable for coupling operations and the B knuckle of no. 5 contour is somewhat better for uncoupling operations, but since the effect of these differences in the steel specimens are slight, the manufacturers shall continue to furnish the knuckle-tail contours as at present, with the final shape to be determined by the service trials.

A AND B COUPLERS ON SERVICE.—testing machine, to try the knuckle contours for coupling and uncoupling, but particularly

ignored. The machine consists of two carriages on an inclined track, each having one coupler mounted level thereon, similar to a freight car, and being electrically driven. The top coupler always remains locked, the lower coupler starts up the incline with knuckle completely open, couples to top coupler, continues upward about 1 ft., dur-

other couplers, knuckle pushed to closed position by a lever, then knuckle thrown completely open by uncoupling rod. Assuming a freight car coupler in service will average daily (365 days to a year) the operations here listed as one cycle, these tests each represent 82 years' wear, disregarding effects on operating parts due to strains re-

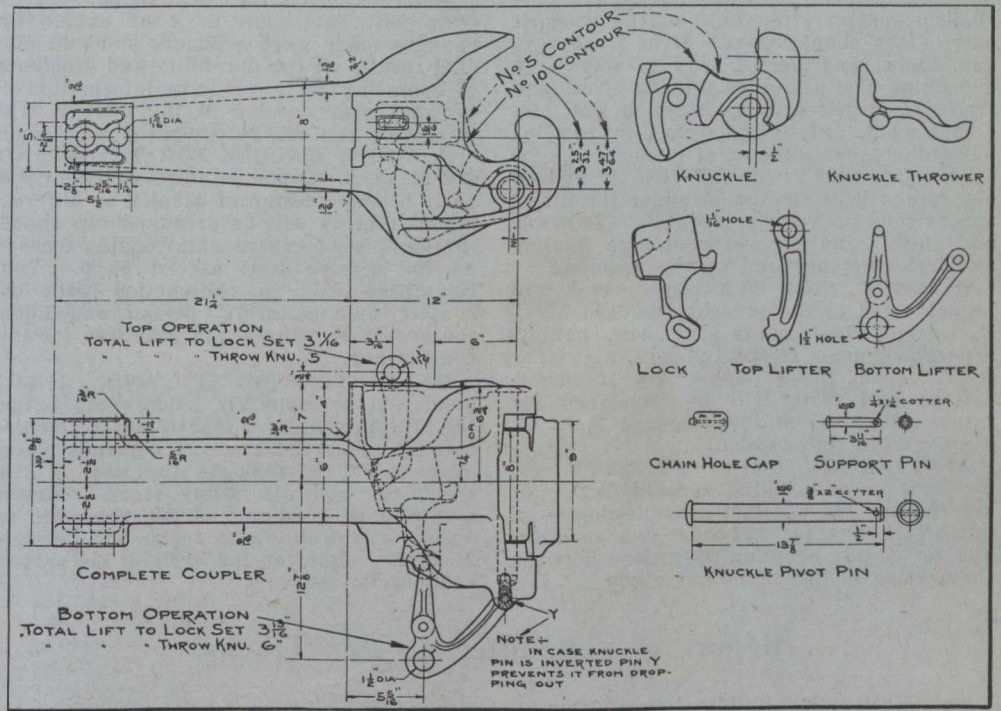


Fig. 2.—Experimental Standard M.C.B. Coupler B.

ing which it is lock-set; the lower car about that time is released by the chain drive, recedes from the top car, which is restricted by a cable, starts down the incline, during which the knuckle is thrown closed and then thrown open before the car is stopped by a buffer. This constitutes one operation or cycle as registered on the stroke counter

ceived in regular service. Each operating coupler tested was, beforehand, laid off, measured, and notes taken on various parts, dimensions and features that were liable to be affected during the tests and very moderately oiled only at this time. Daily logs were taken and the couplers were very carefully and minutely examined after every 10,000 cycles, recording the results and conditions then found by comparing with the various measurements and notes originally made. The machine was out of doors under a shed and severe cold weather obtained.

The results of the tests were very satisfactory and favorable to both couplers. The operating parts naturally were considerably worn, but after each test the couplers were operative in all features with scarcely any impairment of efficiency. New parts were substituted for the worn parts, trying all combinations, and it was found that the couplers were fully operative. Some minor changes were shown to be desirable and these have been made. This was a very severe test and your committee is firm in the belief that not any of the present standard couplers in general use today would meet it.

To date, 2,204 couplers of the A and B type have been ordered by 21 railways, in nearly equal numbers of each type and contour.

BUTT END AND KEY SLOT FOR 6 BY 8 in. shank to accommodate various draft attachments.—The following recommendations or suggestions were received from manufacturers: Not to increase width of butt end over present standard of 5 ins., nor present width, 5 ins. of key. Key slot to be located 5 ins. from rear of coupler butt instead of 4 ins., as at present, and to be made sufficiently large for 7 by 1 1/4 in. key. Rivet holes for securing ordinary yoke to coupler be increased to three to compensate for increased strength of drawbar. Increase length of coupler, measured from striking

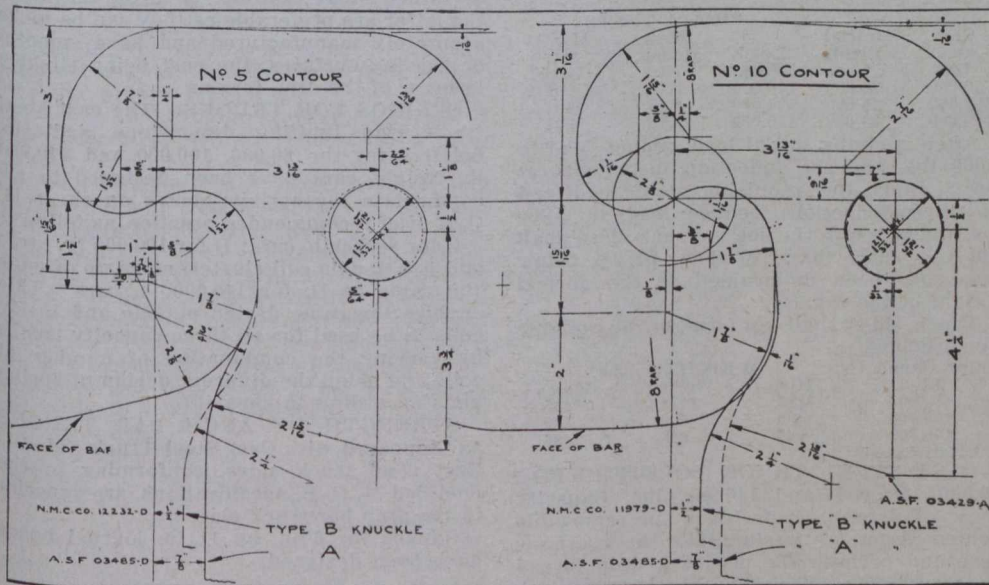


Fig. 3.—Comparison of Knuckle Contours on Couplers A and B.

to test the lasting qualities and efficiency of the operating parts, learn the location, extent and effect of wear of same and ascertain if any changes, however slight, are necessary or desirable in the couplers. While this machine does not administer shocks, it brings out conditions of wear in a week's time that would take several years' service on the road to produce if shocks were

and the normal speed is five to six operations per minute.

Two A couplers no. 5 contour were tested together and two B couplers no. 5 contour. Each of these tests were run through 30,000 cycles, each of which, as described above, consisted of the following operations for the lower or operating coupler: coupling, lock-setting, uncoupling by withdrawing from

horn to rear of butt, to 25 ins. instead of 21¼ ins. as at present. Allow 2 ins. clearance between slot reinforcements on inside of bar instead of 1¾ in. as at present. Increase thickness of key from 1½ in., present standard, to 1¾ in., and increase ribs supporting reinforcement inside bar from ¾ in. to 1 in. Key should be stronger at its elastic limit and ultimate than the knuckle and have slightly greater strength than the weakest part of the coupler head. Heat treat keys and study condition of keys in service to determine best allowable bearing stress and arrive at proper distance through slot. Increase width of butt end from 5 in. to 6 in., beginning taper same as at present.

The following tests of the A and B couplers will be conducted under the direct supervision of your committee: Dynamic and static; angling and coupling; jiggling and lock-creeping; and service machine.

DYNAMIC AND STATIC.—Several will be subjected to the present standard M. C. B. tests—strike, guard arm, jerk, pulling, separate knuckle strike and jerk, and other tests. From these tests a set of specifications and tests will be developed for future purchases of the standard M. C. B. coupler after its adoption.

ANGLING AND COUPLING TESTS, will be made on a machine specially built for determining the greatest possible degree of horizontal angling between two couplers and for testing coupling operations between them when in line or at any angle.

Report of Committee on Car Trucks.

The Master Car Builders' Committee, J. T. Wallis, General Superintendent of Motive Power, Pennsylvania Rd., chairman, and of which J. Coleman, Superintendent Car Department, G. T. R., and L. C. Ord, Assistant Master Car Builder, C. P. R., are members, reported in part as follows:

LIMITING DIMENSIONS FOR CAST Steel Truck Sides for 80,000, 100,000 and 140,000 lbs. Capacity Cars and Revision of Specifications.—To establish limiting dimensions, the following were governing factors: Relation of centre line of draft gear to the bearing surface of the body centre plate largely established the height of the centre plate of the truck bolster from rail; with this as a base the height from top of rail to top of truck bolster (underside of truck centre plate) was fixed at 26¾ ins., with empty cars for all capacities. The establishing of the vertical height from the bearing surface of the truck centre plate to the top of spring cap (or underside of bolster resting on spring cap), fixed at 8¾ ins. for all capacities; this is correlated to the maximum height of side frame from rail, established at 31 ins. Vertical height from top of spring cap (or underside of bolster) to top of side frame is made up of the depth of bolster, amount of clearance between top of bolster and underside of top member of side frame and depth of top member, the dimensions of the latter being dependent upon the capacity. Adopting use of the M. C. B. truck springs C for 80,000 lbs., D for 100,000 lbs. capacity and a five cluster spring made up of coils the same as D, giving a uniform spring height for the three capacity trucks and all springs can be built up from the same unit coils, establishing the height from top of spring plank (or bottom of lower spring cap) to top of rail, of 10½ ins. A minimum of 4 ins. is necessary as a safe clearance between bottom of side frame and top of rail with new wheels, bearings, etc., leaving 6½ ins. as maximum total for thickness of spring plank and depth of bottom member of side frame, which latter is determined by design and capacity de-

JIGGLING OR LOCK-CREEPING TESTS will be made on a machine specially built to impart vibrations and lock-creeping conditions to couplers under tension, and determine if the locks will creep, and, if so, the reliability and efficiency of the lock-to-the-lock or anti-creep device or feature embodied in the coupler.

SERVICE-TESTING MACHINE, FINAL tests will determine to what extent the changes made were a benefit and will give final results on the durability and efficiency of operating parts and give information as to what may develop in the general trial in service and can be compared with same.

FOUNDRY GAUGES FOR THE STANDARD M. C. B. coupler.—Interchangeability of parts of same design of coupler by different manufacturers will be arranged for; should the number of experimental couplers ordered for service trial exceed 5,000. Your committee will, in conjunction with the coupler manufacturers, design and adopt the necessary gauges and practices for this contingency.

HEAT TREATMENT AND ALLOY steels.—It is generally acknowledged that the present coupler is inadequate in strength to meet the ever-increasing demands placed upon it. This suggests the use of heat treatment and also alloy steels. Experiments show good but as yet uncertain results. It is desirable to design the standard M. C. B. coupler on the basis of the present commercial steel.

The widths of bolster openings are governed by the capacity and the width of spring base required, which also controls the wheel base. The cross section of the top and bottom members of the truck side is determined from the capacity and governed by allowable stresses for members made of cast steel and controlled by the specifications and tests.

Each truck side shall be tested in a suitable machine to the following loads for different capacity trucks:

Car Capac., Lbs.	PROOF TESTS.			
	Initial Load, Lbs.	Load, Lbs.	Max. deflec., Ins.	Max. set, Ins.
80,000	20,000	110,000	0.15	0.01
100,000	25,000	125,000	0.15	0.01
140,000	35,000	175,000	0.15	0.01

After applying initial load, reduce load to 5,000 lbs. and set deflection instrument at zero; apply the requisite proof load and measure deflection; reduce load to 5,000 lbs. and measure the set. Truck sides shall not vary more than 3% above or 2% below what has been determined as the normal weight of the casting.

Truck sides shall conform to the weights given below:

Car Capac., Lbs.	WEIGHTS, Lbs.		
	Min.	Norm.	Max.
80,000	*415	*425	*445
100,000	490	500	520
140,000	645	660	685

*** Estimated.**
CAST STEEL TRUCK BOLSTERS FOR 80,000, 100,000 and 140,000 lbs. Capacity Cars.—Bolsters are designed for removable centre plates, as it simplifies the manufacture and permits the use of a drop forged centre plate. The side bearings are adjustable, as the side bearing clearance diminishes more or less on all types of cars with service and it is difficult and expensive to maintain side bearing clearance on cars of steel construction with metal body and truck bolsters unless adjustment is provided for. Provision has also been made for the use of roller or other anti friction side bearings by establishing a uniform slope of 1 in 28, in that portion of the top plate of bolster where these side bearings will be

located. The bolsters shall not vary more than 3% above nor 2% below the normal weight of the casting, and they shall conform to the weights given below:

Car Capac. Lbs.	WEIGHTS, Lbs.		
	Min.	Norm.	Max.
80,000	*660	*675	*700
100,000	735	750	780
140,000	*855	*875	*910

*** Estimated.**
As the pressed steel bolsters (built up type) are in general use, designs are presented, which are interchangeable with the cast steel bolsters, and which would provide an alternate standard. Gauges have been designed with tolerance for gauging the bolster as well as to provide for interchangeability.

SPREAD OF SIDE BEARINGS, CENTRE to Centre, on Various Capacity Freight Cars from 60,000 to 100,000 lbs.—The committee has not been able to decide on the proper distance for spread of side bearings on 100,000 lb. cars and those of less capacity. In view of the fact that there are comparatively few 140,000 lbs. cars in the country, the committee recommends a spread of 50 ins. centre to centre, on cars of this capacity and believe that it would be wise to make the same recommendation in regard to other capacity cars.

CLEARANCE OF SIDE BEARINGS.—The clearance of side bearings depends on the spacing or spread of the side bearings. The following side bearing clearance for new cars is recommended:

	Min.	Max.
Per side bearing	¼ in.	5-16 in.
Total (one truck)	½ in.	¾ in.

CONSTRUCTION OF CENTRE PLATES For Standard Freight Cars.—The present standard centre plate with 100 square in. bearing area has been generally adopted with slight modifications on 80,000 and 100,000 lb. cars, and the performance under cars of 80,000, 100,000 and 140,000 lbs. has been satisfactory. A change in the over all height of the centre plates as well as the rivet spacing is necessary to make these centre plates applicable to cars of steel construction and to the bolsters recommended. It is essential that the centre plates be made of either steel castings or drop forgings; the latter are preferable as they can be more accurately manufactured and have smoother bearing surfaces, the cost being slightly in favor of the drop forging.

SPRINGS FOR TRUCKS.—The cast steel truck side limiting dimensions and the bolsters for the 80,000, 100,000 and 140,000 lb. freight cars have been designed to accommodate the springs shown on sheet M. C. B. H of recommended practice, as follows:

C for 80,000 lb. cars; D for 100,000 lb. cars; and five double coil cluster, made up of coils the same as D, for 140,000 lb. cars. This enables the same design outside and inside coils to be used for all three capacity trucks by varying the combination of number of coils and using the different design of spring caps according to capacity.

STRENGTH OF ARCH BAR TRUCKS as Compared with Cast Steel Truck Sides.—Cast steel truck sides, conforming to the modified M. C. B. specifications, are superior to the arch bar truck sides.

Gauges for 6 in. by 11 in. journal boxes have been designed.

Report of Committee on Damage to Freight Car Equipment by Unloading Machines.

The Master Car Builders' Committee, P. F. Smith, Jr., Superintendent of Motive Power, Pennsylvania Rd., Chairman, reported as follows: Much interest has been taken in the recommendations made last year, by railways owning machines, by in-

dustrial plants and by all manufacturers of car dumping machinery. Much has been accomplished in reducing the damage to freight cars by those applying the blocking to their movable platen type machines in accordance with typical design submitted to the 1913 convention, and adopted as recommended practice.

A member of your committee called on the manufacturers of the machines of the solid floor type and suggested that they give some consideration to modifying their hydraulic clamping arrangement to eliminate the damage to cars. It was found that after receipt of the 1913 report they had done some preliminary work along the line suggested and would be prepared to submit drawings and estimates of changes in existing machines of the solid floor type, and further that no more machines of that type would be built and that future machines would be of the movable platen type. It was also found that the steel manufacturers and industrial plants are taking a keen interest

in the matter and had a committee of thoroughly competent members going over the individual machines, and were having blocking applied as per our recommended practice to movable platen type machines and corrections made to those of the solid floor type.

There are a number of new car dumping machines being installed this year with cradles of increased length to accommodate the larger cars, and after this year's experience with them is analyzed, some modification in our recommended practice may be necessary for these machines. For existing machines we have no modifications of our report of 1913 to recommend, but would impress on all the need of properly spotting cars in cradle, the importance of maintaining blocking by renewing face, the absolute necessity of maintaining extension clamps at all times and to properly supervise machines at industrial plants to insure their carrying out the recommendations of this association.

treating on combustion and fuel economy are furnished to all enginemen. These books and a set of standard instructions, operating rules, book on good firing, firing charts and other information are given to new firemen. A supervisor or road foreman or fireman instructor generally rides with the new fireman for one or two trips in order to get him properly started and to teach him the fundamentals of the art of firing. Most roads have progressive series of examinations pertaining to firing and operation, which each fireman must pass before he can be promoted to engineman.

The method by which enginemen and firemen co-operate to avoid loss and waste of fuel and unnecessary firing, is usually to hold the engineman responsible and to see that he instructs his fireman. Engineman and fireman should work in harmony. They should examine their records on the performance sheet and be inspired to make a good showing.

In a consideration of whether it is good practice to generally inform enginemen and firemen by circulars or charts of the temperatures that can be obtained in the fire-box of a locomotive by the varying degrees of heat and the color of the flame, the majority of the replies indicate that, as an educational measure, it is of value to impart such information to locomotive crews.

Some roads compile data and make up an individual performance sheet, monthly, showing comparison of enginemen in different classes of service on each operating division, based upon the consumption of fuel, lubricating materials and other supplies. Some consider this a good means of checking the results as between individuals, while others take the opposite view, claiming that there is a great lack of accuracy in the data secured and that when figures are not reliable the data are without value.

There seems to be a universal sentiment opposed to a plan of giving money premiums or prizes of any sort as an incentive to enginemen to improve and maintain a good fuel record.

In the preparation of coal for use in making a good fuel record, wherever conditions permit, the bituminous coal should be broken into small convenient sizes, in order to secure the best results from hand or stoker firing, because the smaller lumps burn more readily and tend to produce a greater evaporation per pound of coal. The best sized coal seems to be that which will pass through a 1½ in. and over a ¾ in. screen. For anthracite burning locomotives, egg size, or that which will pass through a 2¾ in. and over a 2 in. screen, seems to be generally considered best. For a mixture of anthracite and bituminous coal, a general rule is difficult to state, because so many variables enter into the proposition.

For making the best fuel record, the majority believe that coal run over a ¾ in. screen will make a better record than run of mine coal on a basis of lbs. of coal burned, but if the price is considered, run of mine coal containing not above 30% slack will make the best record.

The most valuable essential of fuel economy is good supervision.

Of devices or appliances for use on locomotives or tenders to prevent waste en route and at coaling stations, the following materially assist: Iron or wooden coal gates of good design; fenders on tender platforms and inside of gangways to keep coal from falling off; movable covers over shaker bar openings, or collars around same; and prevention of overloading of tenders.

Some roads have experimented with various types of mechanical coal pushers, but the results are not, as yet, conclusive.

Report of Committee on Fuel Economy.

The American Railway Master Mechanics' Committee, W. Schlafke, General Mechanical Superintendent, Erie Rd., chairman, reported in part as follows:—

Seventeen questions were sent out to the mechanical department heads of the railways; a digest of the answers is given herewith.

Clean boilers contribute largely to fuel economy; scale formation leads to broken staybolts, leaky tubes, seams and mud rings, with the consequent loss of boiler efficiency and increased fuel consumption for a given amount of evaporation. Experiments show that every 1-16 in. of scale requires 15% more fuel. In some localities, the water used for locomotive boiler feed contains a certain amount of decayed vegetable matter, and the scale is somewhat soft and porous. The loss of fuel is very much less, with this sort of scale, than with hard scale. Good boiler feed-water, together with thorough cleaning of boilers by washing out, keeps the amount of scale formed down to a minimum.

Keeping the valve gear in good condition, in order to obtain correct steam distribution, and by proper lubrication, to prevent hot bearings, the friction or internal losses in the locomotive will be reduced to a minimum.

Tests of superheater locomotives in both passenger and freight service have shown a saving in fuel, as much as 25%; somewhat less than this must be expected in regular service. Superheaters make it possible to get a higher sustained tractive power out of a locomotive. The savings resulting from their use, therefore, would not show upon a locomotive mileage basis, but would appear when figured on a ton mile basis, which is, to a certain extent, proportional to the work done.

Experience has not yet justified the application to locomotives generally of preheaters and feed water heaters.

Outside valve gear holds its adjustment and gives a better steam distribution, resulting in more or less indeterminate economies.

About 10% fuel economy can be obtained from the brick arch. It also affords considerable protection to the flues by keeping them at a nearly constant temperature and thus prevents certain losses due to leaks, and the arch tubes give increased heating surface of the most valuable kind.

It is doubtful whether savings can be claimed for the mechanical stoker. Its chief merit is its capacity for firing larger quantities of coal than can be handled by a fireman.

Special appliances, such as automatic fire doors, power reverse gears, rectangular and variable exhaust nozzles, and smoke consuming devices all have a tendency to produce economy. An efficient set of draft appliances assists in producing a saving of fuel. A special recording device attached to the safety valve will show how long it has been open during any stated period. A 3 in. valve carrying 200 lbs. will waste about 20 lbs. of coal per min. To promote the greatest measures of fuel economy, several roads have organized fuel departments and placed in charge a fuel engineer, or a superintendent of locomotive operation, reporting to the Mechanical Department head. This department has jurisdiction over matters relating to the proper operation of locomotives, economies in fuel, lubricants, other supplies and kindred subjects. On some roads a travelling engineer and a travelling fireman are assigned to each main line division, and in some cases covering side lines as well.

For the instruction and encouragement in locomotive operation, on the Erie Rd., a supervisor of locomotive operation or road foreman of locomotives to every 50 locomotive crews or less is required, each having supervision over one specific class of service. Their duties cover instruction of enginemen in the proper methods of firing, efficient handling of the locomotive, and operation of fuel saving devices, and hold periodic class meetings at the different terminals, where the road instruction is carried further by lectures. When an engineman has a record up to a certain fixed standard, the number plate of his locomotive is painted red. After he has belonged to the order a sufficient length of time to warrant it, his name is placed on the cab of his locomotive in letters of gold.

Class or individual instruction is essential, but the latter is preferred, and should be followed up invariably by practical demonstration. Locomotive class instruction at terminals is growing in favor.

For the instruction of enginemen, firemen, hostlers and locomotive preparers, when first entering the service, on the properties of fuel and the system to be practised to secure the best results, firemen are usually employed by the road foreman or supervisors of locomotive operation, and before going into regular service they are given some preliminary instructions and practice. They are required to make a stated number of trips as a student fireman with an engineman competent to instruct them in the proper methods of firing. Instruction books

The only advantage to be gained by storage of coal is that it provides a supply of fuel during periods of strikes or shortage, but it is detrimental to fuel economy for the following reasons: Double handling increases cost; spontaneous combustion is liable to occur; bituminous coal slacks; and when stored on the ground, dirt is apt to be picked up with it.

As a rule, an analysis of the constituent parts of coal is not furnished to engineers and firemen, because data of this sort are not considered of much value to engineers.

It has been found generally very important to instruct engineers and firemen in the principles of combustion. They should be made to understand how the gases of combustion influence the color of the fire and that unburned gases cause black smoke. This subject should be thoroughly covered in the instruction books on fuel economy, as well as in the individual and class instruction.

CONCLUSIONS.—Care should be exercised always to have fuel furnished according to a rigid specification and this should be further followed by close inspection at the mines. Proper grades of fuel should be maintained for each class of service as far as possible in order to keep the efficiency of both the engineers and the locomotives as high as possible.

Too much care can not be exercised in keeping accurate coal records, especially at coaling stations. At the same time losses in fuel by overloading tenders and careless handling of locomotives at terminals should be stopped as far as possible. Fuel savings must be made by all concerned and not by the engineers alone, if the coal bills are to be reduced as much as they can be.

The boiler feed water should be improved wherever possible, and if necessary good treating plants should be installed. The savings resulting from reduction of scale

and decreased boiler maintenance will pay the cost of treating boiler feed water where necessary. Suitably located blow off cocks of good design are also a great aid in keeping down boiler scale.

Emphasis should be laid upon the necessity of close co-operation between engineers and firemen, and between these men and their supervising officers; strict adherence to the proper methods of operating locomotives, proper care and adjustment of lubricators to avoid damage to valves, valve seats and piston packing; and the maintenance of standard adjustments of front end arrangements, exhaust nozzles and other parts essential in producing free steaming locomotives. Definite assignment of the most suitable classes of locomotives to each division, and as far as possible, assignment of regular crews to locomotives, are great aids in fuel economy.

The recent successful application of powdered fuel to industrial plants points the way to large savings in locomotive fuel consumption, provided the system can be successfully adapted to this kind of service. Although there will be an increase in cost per ton due to pulverizing the coal, the expected savings should more than offset this. Some of the advantages claimed for powdered fuel are: Greater capacity of locomotive, and lightening the work of the firemen; reduced fuel consumption due to more perfect combustion, and elimination of standby losses; reduction of smoke; and ease of handling.

Notwithstanding the mechanical aids to effect economy of fuel, it is a settled fact that a well organized department, invested with full charge of the fuel problem, and nothing else, will accomplish material results. Experience of many roads proves conclusively that the institution of such a department is followed by savings which abundantly justify the expense of the administrative and supervising organization.

Report of Committee on Steam Locomotives, Method of Conducting Laboratory and Road Tests.

The American Railway Master Mechanics' committee, C. D. Young, Engineer of Tests, Pennsylvania Rd., chairman, and of which W. H. Flynn, Superintendent of Motive Power, Michigan Central Rd., formerly Master Mechanic of its Canada Southern division, is a member, reported in part as follows:

Locomotive tests are of two kinds, laboratory and road. The former are made at a locomotive testing laboratory where the driving wheels can be mounted on the supporting wheels of a friction brake apparatus for suitably disposing of the power. The road tests are made under conditions of service on the road, the locomotive hauling a train of cars.

Laboratory Tests.

The object of a laboratory test is to determine the steam and coal consumption per unit of power when the locomotive is operated under fixed conditions.

PREPARATIONS.—All driving wheels should be turned to same diameter and should be standard contour. Each pair of driving wheels should be checked to see that they are correctly quartered for the crank pins. If the locomotive selected has ever been through the shops for general repairs, the frames should be tried to see that they line with the cylinders. The boiler tubes must be new or newly pieced, so as to be free from boiler sediment. The steam cylinders should be approximately the same diameter and as near to that called for as standard for the class of locomotive, as practicable, and they should be bored if not in good condition. The piston

packing rings should be in good condition. On D valve locomotives, the valves and seats should be faced; and on piston valve type, old bushings should be bored if not in good condition, or new bushings applied. Piston valve packing rings should be examined and in good condition, after which a test pressure of at least 60 lbs. should be applied to the steam pipes to determine that the throttle, steam pipes and exhaust passage are tight. The front end arrangement for the locomotive should be carefully gone over and checked with the print in accordance with which the front end is supposed to have been applied. The stack and draft pipe should be lined to determine that it is properly erected with reference to the exhaust nozzle. Steam joints in the injector and delivery pipes should be tested to determine that they are steam tight. The lift of the throttle valve should be determined for each live notch on the throttle lever quadrant; when necessary, the cut-off should be taken for each notch on the reverse-lever rack. The locomotive selected should reach the laboratory at least 4 days prior to the time when it is scheduled to go under test, in order to permit the application of all instruments and to take the necessary measurements of various parts of the locomotive.

FUEL.—A standard coal should be selected that can be easily obtained on short notice, and in accordance with the special object in view. If maximum efficiency or capacity is desired, the coal should preferably be some kind that is regarded as a

standard for the locality where the locomotive is operated. When oil fuel is used, the rule governing the tests may be modified to conform to the characteristics of liquid fuel.

THE APPARATUS AND INSTRUMENTS required for laboratory tests of a locomotive are as follows:—Platform scale for weighing coal and ash. Tanks and scales for weighing water. Graduated scale attached to water glass. Pressure gauges graduated to at least pounds for boiler, branch pipe, receiver, exhaust and at other points as is required. Draft gauges for smoke box, fire box and ash pan. Thermometers for calorimeter, branch pipe, receiver and exhaust. Pyrometers for fire box, smoke box and at other points as is required. Steam calorimeter. Steam cylinder indicators. Speed recorder to denote revolutions of driving wheels. Gas analysis apparatus. Friction brake apparatus. Dynamometer for determining the pull at drawbar. Some form of indicator rigging. Planimeters, micrometers, scales, calculating instruments, etc. A calibration should be made by water glass method of both safety valves, and a correction made during a test. The scales, gauges, thermometers and pyrometers should be carefully calibrated at specified intervals.

APPLICATION OF INSTRUMENTS.—The pressure gauges for boiler, branch pipe and exhaust should be connected with a long siphon and located at convenient points for the observers. Care should be taken to make correction for pressure should the gauge be located so that the water head would affect the reading. For taking temperature of steam in the branch pipe and exhaust passage, thermometers should be inserted into wells, and given proper depth of immersion.

The indicator reducing motion should be some form of pendulum type with light tube for transmitting the reduced motion to a point near the indicator. The pipes leading from the cylinder to the indicator should be not less than ½ in. inside diameter, and they should connect into the side of the cylinder rather than into the heads, thus making a very short connection. Short bends in the pipes should be avoided and they should be well lagged to prevent radiation. A light framework should be secured to the cylinder to act as a brace for the indicators, and for the motion-rod supports. Absolute rigidity is highly essential in this particular. Care should also be taken to set the indicators in such a position, that the finger on the end of the motion rod travels in a direction pointing to the groove in the drum proper.

Draft gauges consisting of U tubes properly graduated in inches, containing water, should be placed at convenient locations, and connected at the smoke box or any other point at which the draft is taken, with a ¼ in. pipe. A rubber tube connection should be provided to connect the draft pipe with the U tube. In the smoke box the pipes should be located at the horizontal centre line of boiler in front and back of diaphragm.

The draft in the fire box should be taken through a drilled stay bolt, located at a point about half the length of the fire box and about 24 ins. above the grates. The draft in the ash pan should be taken at some convenient point at about the centre of the entire grate area.

The smoke box pyrometer or thermometer should be inserted so that the hot point or bulb is below the tip of the exhaust nozzle and in front of the table plate. If a thermometer is used for this purpose, it should be graduated to 1,000 degrees. The

tube placed in the fire box for inserting the pyrometer should be located opposite the stay bolt drilled for the draft. This tube should be a piece of 2 in. boiler tube and located on the centre line of a stay bolt.

The gas sampling pipe should be located at the smallest area under the draft plate, and in the centre of this area. This pipe should have numerous drilled holes equally spaced and the total area of the holes should not be more than the inside area of the sampling pipe.

A steam calorimeter should be attached either at the dome at a point close to the throttle valve, or to the branch pipe according as it is desired to obtain the character of the steam at one point or the other. The former location is preferred. A perforated $\frac{1}{2}$ in. pipe should be used for sampling and conveying the steam to the calorimeter.

OPERATING CONDITIONS.—In a laboratory test where maximum efficiency is the object in view, there should be uniformity in such matters as steam pressure, quantity of coal supplied at each firing, thickness of fire and in other firing operations. The rate of supplying the feed water should be uniform through the entire test, and a certain level (about second gauge cock), should be maintained from start to finish of test.

THE DURATION of a laboratory test of a locomotive will depend on the character of the fuel used, rate of combustion and working limitations of the revolving parts. The test should preferably be continued until at least 25 lbs. equivalent evaporation of water per sq. ft. of heating surface has been obtained. If from the graphical log the coal and water performance are uniform, tests of 3 hours will be the limit.

STARTING AND STOPPING.—The fire having been thoroughly cleaned and banked when necessary to permit coking, previous to starting the test, the bank should be broken up and fresh fuel supplied. The locomotive should be started and run at the speed of the test a sufficient length of time to build up a level fire, and which should be, as near as possible, so maintained throughout the test. When all conditions of fire and speed have become uniform, the thickness of the fire should be noted, but the starting signal for the beginning of the test proper should not be given until the locomotive has been run at least 10 minutes. Observe the steam pressure and time and record the latter as the starting time of test. Water level should be maintained uniformly throughout the test. The ash pan should be cleaned at the starting signal. When the end of the test approaches, the fire having been kept at a uniform thickness during the run, the time and water level should be noted and test stopped. When the test is completed the ash pan should be cleaned and cinders, if any, should be removed from the smoke box.

RECORDS.—A log of the data should be entered on printed forms and records taken at 10 min. intervals, unless a special test is in progress, where the readings may be taken more frequently. The coal should be weighed out in not less than 300 lb. lots and the time taken for each lot burned. Weighing tanks of sufficient capacity should be provided to maintain water in the supply, varying in head not more than 6 ins., and readings of the water consumed should be plotted upon the graphical logs at convenient regular intervals. Indicator diagrams should be taken at the same periods the other data are taken.

A sufficient number of observers should be supplied in order that all important observations should be taken simultaneously. At a laboratory where 2 tests are made each day, the number of men required is as follows:—Foreman; assistant foreman; stenographer; chemist; 7 computers; brake

wheel operator; dynamometer observer; smoke observer; cab and coal observer; temperature and pressures; speed, boiler pressure, drafts and pyrometers; water observer; 2 indicator observers; gas sampler; 2 oilers; engine operator; 2 firemen; 3 draftsmen; and 3 coal passers and janitors; totaling 32 men. The force would have to be increased should a Mallet locomotive be tested. All observers, operators, oilers and firemen should assist in dismantling and fitting up laboratory when locomotives are changed.

THE ASH AND REFUSE withdrawn from the ash pan and smoke box at the end of the test should be weighed in a dry state, and if desired, sample taken for analysis of heating value and unburned carbon.

SAMPLING COAL.—If the coal to be tried is more than the amount necessary to make the test, it should be sampled according to the recommendations of the committee of the American Chemical Society governing carload sampling, which are as follows:—6 shovelfuls should be taken along each side and 6 across the centre of the car. If the car is to be unloaded into bins, a small amount of coal should be taken off the conveyor buckets or wagons while the entire car is being unloaded. In all events the sample should not be less than 300 lbs., and after it is crushed and quartered about one quart should be taken and placed in an air tight jar for chemical analysis. On all tests the total moisture should be used in the calculations.

CALORIFIC TESTS OF COAL.—The analyses commonly made are what are termed "proximate" analyses; these consist in the determination of the following items:—Fixed carbon, volatile matter, moisture hydroscopic, moisture total, ash and sulphur, and the B. t. u. per pound of fuel.

For complete determinations of the quality of coal, it is necessary to make ultimate analysis, which requires the determination of the following additional items:—Carbon, hydrogen, nitrogen and oxygen by difference.

THE DATA AND RESULTS of the laboratory test should be compiled in a tabular form as detailed in the report, 792 items in all being considered. These items are divided into the following general groups, with the number of items in each group accompanying:—Driving wheels, 25; engine truck wheels, 7; trailing wheels, 6; wheel base, 9; weight of locomotive, 17; cylinders, 12; piston stroke, 9; clearance in per cent. of piston displacement, 13; receiver volume, 7; steam ports, 29; piston rods, 9; tail rods, 9; valves, 9; valve travel, 9; valve steam lap, 13; valve exhaust lap, 13; miscellaneous, 7; boiler, 7; tubes, 12; superheater, 11; fire box, 10; fire doors, 7; grates, 9; air inlets, 11; heating surface, 11; boiler volumes, 7; exhaust nozzle, 11; reverse lever, 7; ratio, 11; constants, 14; piston displacement, 13; observed data, 6; speed, 9; position of levers, 6; temperatures, 14; pressures, 14; draft, 9; injectors, 4; quality of steam, 10; coal, sparks and ashes, 14; smoke, 6; analysis of coal, 9; calorific value, 8; analysis of smoke box gases, 10; water, 11; dynamometer, 8; cutoff, 15; release, 15; compression, 15; pressure from indicator cards, 15; steam chest pressures, 11; pressures at cutoff, 15; pressure at release, 15; pressure at compression, 15; least back pressure, 15; boiler, 7; evaporation, 12; equivalent evaporation, 29; summary of engine results, 15; receiver, 8; expansions, 10; i.h.p., 15; division of power, 12; per i.h.p. hour, 9; summary of locomotive results, 9; per 1,000,000 ft. lbs. at drawbar, 18; machine friction of locomotive, 8; efficiency, 7; ratios, 8; summarized statement of average results, 41.

Road Tests.

THE OBJECT of a road test is to determine the steam and coal consumption of a locomotive per unit of power under practical conditions of the locomotive in railway service.

ALL OF THE PREPARATIONS given in laboratory tests should be carried out preparatory to placing the locomotive in service, with the possible exception of not having all driving wheels newly turned, and equipping the locomotive with the various instruments that can be done while the locomotive is in the shops for repairs.

FUEL.—The same consideration should be given to the fuel as on a laboratory test. To facilitate the measurement of coal and the determination of the quantity used during any desired period of the run, it is desirable to provide a sufficient number of sacks, of a size holding 100 lbs., and to weigh the coal into these sacks preparatory to starting on the test.

THE APPARATUS AND INSTRUMENTS required for a road test of a locomotive are as follows: Platform scale for weighing coal. Crane, spring balance and bucket for weighing ash. Tank and scales for calibrating the tank. Graduated scale attached to water glass on boiler. Float for measuring height of water in tank, or, if preferred, graduated scales on all four corners of the tank. Pressure gauges graduated to pounds for boiler, branch pipe, receiver and exhaust. Draft gauges for smoke box, fire box and ash pan. Thermometers for calorimeter, branch pipe, receiver and exhaust. Pyrometers for fire box, smoke box, and at other points as required. Air pump counters. Water meters. Steam calorimeter. Steam cylinder indicators. Speed recorder for the revolutions for the driving wheels in case no dynamometer is accessible; on Mallet locomotives two recorders should be used. Some form of pendulum indicator rigging. Traction dynamometer for determining pull at drawbar, with its complete equipment. Electrical connection between locomotive and dynamometer. Planimeters, micrometers, scales and calculating machines, etc. Steam used for auxiliary purpose other than the cylinders, such as air pump, calorimeter, injector overflow, train lighting and heating, and what escapes from the safety valves, may be estimated from data obtained by testing them either before or after the trial. The scales, gauges and pyrometers should be calibrated before and after the tests are made.

APPLICATION OF INSTRUMENTS. All of the instruments given under laboratory test should be carried on road tests as far as practicable, with a few exceptions. The indicator rig should be some form of pendulum motion with a light tube for transmitting the reduced motion to a point near the indicator. The apparatus which is most suitable consists of a three-way cock for the attachment of the indicator, with a steam chest connection, so that diagrams can be drawn on each cylinder card and pressure determined. The three-way cock should be provided with a clamp rigidly secured to the cylinder and thus overcome any tendency of the indicator to move longitudinally with reference to the driving rig. The support for the motion rod should be secured to some point on the steam chest. Care should be taken to set the indicators in such a position that the finger on the end of the motion rod travels in a direction pointing to a groove in the drum proper. The pipes leading from the cock to the cylinder should be not less than $\frac{1}{2}$ in. inside diameter, and if possible not exceeding 36 ins. long. They should be connected into the side of the cylinder, rather than into

the heads. Sharp bends in the pipe should be avoided and they should be well lagged to reduce radiation.

If a dynamometer car is not used, a stroke counter should be placed at some convenient point in the pilot box to record the revolutions of the drivers. This can be conveniently driven from a finger on the motion rod of the indicator rigging.

To facilitate the working of the men who operate the indicators and read the instruments at the front of the locomotive, and to protect them from wind or rain and jolting, a suitable pilot box extending back to the cylinder and properly secured to the bumper beam should be provided.

Whenever practicable, the bulb of the thermometers used in branch pipe, receiver or exhaust should come in direct contact with the steam and no wells used. When thermometers are placed in wells, they do not respond quickly with the different changes in the working of the locomotive.

The water meters should be attached to the suction pipes of the injectors, and located at points where they can be conveniently read while the locomotive is in motion. Each meter should be provided with a check valve to prevent hot water from flowing through them from the injectors, and strainers to intercept foreign material. With the water scoops it will be impossible to use a float, but when tests are made on roads not using water scoops, a suitable float should be made for determining the water consumption. The water level may be established by using a rubber hose with glass tube inserted in the end, which will indicate the height of water in the tank, this tube to be brought in contact with a properly calibrated scale, or, if more convenient, long glass tubes may be provided at each corner of the tank for the same purpose. In all cases the term "branch pipe" refers to the steam supply pipe to the cylinders and not the injector branch pipe.

OPERATING CONDITIONS AND DURATION. The same operating conditions should be maintained as far as practicable as on a laboratory test. The duration of a test is the running time minus the time the throttle is closed, and depends upon the length of the run between locomotive terminals. In fast passenger service the runs should be, if practicable, at least 100 miles. In service requiring frequent stops and in freight service, the distance may be much shorter. The length of time upon which the hourly rate of consumption and evaporation are based is the total time that the throttle valve is open and not elapsed time between the starting and stopping time.

STARTING AND STOPPING. The fire having been thoroughly cleaned, banked to permit coking, fresh fuel should be supplied to a level thickness which will be required for the run. After the locomotive is attached to the train, observe the pressure, the water level or meter readings, and when the locomotive starts take this as the starting time. Thereafter cover the fire with weighed coal and proceed with the regular work of the test. The ashes and refuse should be removed from the ash pan and smoke box before the locomotive is coupled to the train.

During the run the fire should be maintained in as equal and uniform condition as practicable, and when the end of the route is reached the fire should be as level and approximately the same thickness and condition as at the start. When the locomotive is stopped and the proper level of the fire obtained, the weighed coal should be discontinued. If during the run a stop of over 7 mins. is made, and in order to keep the fire in proper condition, fresh fuel must be supplied; this should be selected from the

unweighed coal. There should preferably be no water supplied to the boiler, and if it is supplied, allowance should be made for same.

On reaching the terminal, the fire being in the same condition as at the start, the water level and water supply should be noted. The time the locomotive comes to rest should be the time of stop of test.

RECORDS. The tests should be in charge of a competent person who is thoroughly familiar with road operations. The number of observers required for a test depends upon the nature of the data to be obtained. When making an efficiency test at least 6 observers should be located on the locomotive, 2 for taking indicator diagrams and any other data that can be taken from the pilot box, 2 for cab data and 2 for coal and water records. It is frequently necessary to increase this force when taking special data. In the dynamometer car at least 4 observers are required, 1 to record the time of each start and stop, passing each station and recording mile posts, points of curvature and tangent and any other important information; 1 to record all information on the diagram and keep track of indicator cards, and 1 to take car numbers and weights of trains; this latter man can also act as a relief observer. When making test of Mallet type of locomotive, the locomotive force is increased to take indicator cards from the low pressure cylinders.

The time to take records depends entirely upon what facilities are available for recording same. If a dynamometer car is available for the tests, records should only be taken when some change in the operation of the locomotive takes place, such as throttle lever, reverse lever and boiler pressure. If the dynamometer car is not available, all records should be taken preferably every 5 mins.

Special reading of the meters and total number of sacks of coal fired should be taken at specified stopping and passing points. Careful observations should be made throughout the run, of the time passing all important points, arriving and leaving each station, and the time that the throttle valve is opened or closed, not only at each stop, but when drifting.

ASH AND REFUSE AND SAMPLING COAL. In weighing and sampling the ash and refuse, the same preparation as described for laboratory tests should be followed as far as practicable. The coal should be sampled while it is being weighed off in 100 lb. lots, and a small proportion taken at different times until about 300 lbs. is obtained. This should be crushed and quartered and about one quart placed in an airtight jar and sent to

chemist for analysis. When this method of sampling is used, care should be taken that the coal does not take on additional moisture, due to leaky cistern or sprinkler. If there is any question as to the coal taking additional moisture after it is once weighed out, sample should be taken from each sack as it is emptied. On all tests the total moisture should be used in all calculations. The same practice as used on laboratory tests for calorific tests of coal should be used on road tests.

DATA AND RESULTS. The data and results should be reported in accordance with the form given for laboratory tests as far as practicable, and in addition a summarized form should be made giving some additional 29 points dealing specifically with the road run as distinct from a laboratory test.

DISCHARGE FROM LOCOMOTIVE SAFETY VALVES. To determine the amount of steam discharged from the safety valves of a locomotive undergoing a road test necessitates the following preparation, as determined by road tests on the Norfolk and Western Rd.—The outer side of one of the safety valves is drilled and tapped near the top of the muffler for the insertion of a plug (flush with the inside wall of the valve muffler), threaded at each end with a $\frac{3}{8}$ in. pipe thread. The plug forms a conical convergent nozzle having a minimum orifice of 3-32 in. A $\frac{1}{4}$ in. w.i. pipe is run from the plug connection down to the rear of the locomotive cab roof, where a flexible connection, such as a rubber steam hose, is made of sufficient length to reach the bulkhead of the tender. From here a $\frac{1}{4}$ in. pipe is run down along the side of the tender to a point where it is directed into the water compartment and connected to a 1 in. coiled pipe, or condenser, extending down to the bottom of the tank and connecting with a small reservoir located on the outside of the tender frame. Steam, which is admitted to this line when the safety valves lift, is condensed in the coil and collected in the reservoir. A drain cock located at the bottom of the reservoir is used to draw off the condensed steam at the end of each test for the purpose of making the desired calibration. The accuracy of the determination required previously demands a very careful calibration of the safety valve and the orifice, so as to ascertain the exact ratio of steam discharge through the orifice to the total amount of steam discharged through the safety valves. This ratio determined, and the amount of condensed steam passing through the orifice ascertained at the end of the test, the discharge at the safety valves may be calculated for the test period.

Report of Committee on Locomotive Headlights.

The American Railway Master Mechanics' Committee, D. F. Crawford, General Superintendent of Motive Power, Pennsylvania Lines, chairman, presented a very exhaustive report of 330 pages, covering its investigations. A long series of tests were conducted, and in order to thoroughly cover the work the majority of the types of head lights on the market were procured, and additional headlights were assembled, in order to completely cover the range of light intensity from the minimum oil headlight to the maximum electric arc headlight. The investigation was then carried on to determine the desirable and objectionable features of headlights of different intensities, irrespective of the character and source of light, arrangement and design of reflector, etc. In covering this vast amount of work there was an average of twenty

men devoting their whole time to the investigation for five months. All these numerous tests and the methods under which they were conducted, are covered in detail in the report, the observations being depicted graphically on charts. An appendix covers all the recent headlight legislation by the several State legislatures in the United States.

In rating the headlights it was decided to assume as the reference plane the horizontal plane 3 ft. above the rail, ahead of the locomotive, and to consider the intensity of rays striking this plane at various points. All laboratory readings were taken normal to the ray in a vertical plane, 25 ft. ahead of the focal centre, and perpendicular to the axis of the beam. Readings were taken at angles to correspond to stations in reference planes 50, 100, 200, 300,

400, 500, 600, 700, 800, 900 and 1,000 ft. ahead of the focal centre. Three points were taken for each station, one corresponding to the centre of the track, and one corresponding to 20 ft. each side of the centre, the three points being in the same straight line at right angles to the beam.

RECOMMENDATIONS AND CONCLUSIONS.—In order that a headlight shall be of such intensity as not to cause a misreading of signals, obscuring of hand signals, fuses, red lanterns and classification lamps by opposing headlights, and be of such intensity as not to temporarily blind the engineman looking into the same, it must have an apparent beam candle power not greater than 3,000, referred to the centre of the reference plane, from 500 to 1,000 ft. ahead of the locomotive.

In order that the engineman shall have sufficient illumination ahead of the locomotive to allow him to readily perform his duties while operating in and out of passenger terminals and industrial sidings, while switching in yard, and to readily locate whistle posts, yard limit and crossing signs and such other landmarks en route, a headlight, due to depreciation or

to variation in the intensity of the source, must not at any time during service have apparent beam candle power less than the following:—

Central readings.		Readings 20 ft. each side of centre.	
Distance	Apparent c.p.	Distance	Apparent c.p.
500	450	50	30
600	490	100	110
700	500	200	225
800	500	300	315
900	500	400	350
1000	500		

The above readings are to be considered independent of the location of the headlight, the source and intensity of the light, the design of reflector, etc. To design a headlight to meet the above requirements, the height of the headlight above the rail must be decided on; then, with a given kind of light, the design of reflector, the relative arrangement of reflector and source of light, the intensity must be such that the readings will fall below the designated maximum with sufficient margin above the minimum requirements that they will not at any time, during the depreciation in the source of light, reflector, etc., fall below the minimum requirements.

The Use of Electric Motors in Railway Shops.

By B. F. Kuhn, Master Mechanic Lake Shore and Michigan Southern Railway.

No hard and fast rule can be laid down as to just what system should be used in any particular shop until the local conditions have been thoroughly studied and analyzed. There are two great divisions: the alternating current and the direct current systems. Each has certain advantages and its champions, but before adopting either system the actual cycle of operation of each individual machine must be carefully considered before a selection is made.

Considering direct current for railway shop service, the voltage automatically established as 500 v.d.c. is unsuitable for use on account of its tendency to hang on after an arc has once been formed, and the severity of a flash, shock or burn that an attendant might receive; 110 v. is too low on account of the amount of copper required and also the brush, commutation and contact requirements of the motors, and controllers, etc. 220 v. seems to be the ideal for d.c. motor drive, and with a mixed load of motors and lighting, 3 wire d.c. generators can in many cases be used to advantage. The 3 wire d.c. distribution also has its advantages for motor drive in that a wide range in speed can be secured and the motor will be operating very efficiently at all times.

The type of motor to use in any particular case must necessarily depend on the operation to be performed, thus on cranes and hoisting work the motors should in most cases be series wound, but there are some cases in hoisting and conveying work where it is necessary to use either a compound winding or an interpole motor, as it is possible under certain conditions for a straight series wound motor to run away with a light load, and this would not be possible where the motor is provided with a shunt winding to prevent the speed of the motor reaching the danger point. This type of motor is also suitable for use on transfer tables and turntables. There are other operations which require a heavy starting torque from the motor and, when in operation, require that the motor drop off in speed as the load comes on, such a cycle of operation, for instance, as occurs on a punch or shear, or any other tool provided with a fly wheel, and for this class of service a compound wound motor should be used. Other drives require comparatively small starting

torques but require constant speed after being put in operation, such as driving line shaft or any similar operation; a shunt wound motor should be used.

In applying motors to machine tools, one must again carefully consider the cycle of operation before selecting the winding for a motor, and many of the motors used on machines tools are combinations of the three different types of motors described above. On some machine tools a small amount of variation is sufficient and increases in speed from 10 to 15% may be secured on the straight shunt motors, but where the range in speed would amount to 2 to 1, 3 to 1, or 4 to 1, motors for such operation should be of the shunt wound interpole type. These motors commute very successfully over the whole range in speed. Wherever a cycle of operation is peaky, as in the case of a planer, motors of the interpole type should be used. Just to point out what can be done in this matter of speed variation, I would state that there are in use today motors of 100 h.p. capacity that have a range in speed from 100 to 1,200 r. p. m., this variation in speed being secured without keeping in service any series resistance.

The d.c. motors of the compound wound, shunt, and interpole types are generally provided with starting devices equipped with overload and no voltage release coils, this being a simple and effective means of protecting the motors and tools from injury due to an overload or to the failure of power and its sudden restoration to the line before an attendant might have an opportunity to cut the motor out of circuit. D.c. machines have their commutators and brushes which require care and attention, but commutator trouble has been reduced considerably owing to the fact that motor manufacturers have adopted one method or another to increase the commutating capacity of their motors. It will be seen from the foregoing that the d.c. system has certain advantages, particularly in its flexibility, for it is possible to secure a d.c. motor that will efficiently meet almost every conceivable cycle of operation.

The a.c. motors are divided into three general divisions: the short circuit induction motor, the slip ring induction motor and the synchronous motor. The short circuit

type requires from 3½ to 4½ times full load current from the line while developing full load torque at starting; the slip ring type will draw 1½ times full load current from the line while developing full load torque at starting, and the synchronous motor will draw approximately 3 times full load current from the line while developing 3-10 full load torque. The short circuit type does not lend itself to variations in speed as does the shunt wound d.c. motor and it is, therefore, suitable for constant speed operation only. The resistance of the motor, however, may be varied so as to give almost the same characteristics as the compound wound d.c. motor. This type of motor is especially adapted to punches, presses, etc., of moderate sizes, but there are cases where extremely large presses are used where it is desirable to use the slip ring type induction motor rather than the short circuit type. The slip ring type induction motor is used for hoisting, conveying, cranes, etc. The beauty of the short circuit type is that it has no moving contacts, the only rubbing parts being two bearings. The short circuit type are normally also provided with no voltage release coils in their starting devices and are also provided with overload release coils or fuses. The series wound d.c. and the slip ring type motors are also provided with fuses or circuit breakers, as the case may be, depending upon the class of work they are being called upon to do. Other features that have been developed for different controls are the remote control which allows the operator to start or stop a motor which may be located some distance away. Then we have the master type controller, in which the operator simply operates the master control and the controller itself is operated by electromagnets, thus relieving the operator of all the manual work. There has also been developed the push button type controller, which simply requires that the operator to start a machine press a button and the machine will automatically come up to speed, the current being limited at all times by the controller so that there is no unnecessary jar or strain as the tool starts from rest and comes up to its normal speed.

In the woodworking department, in many cases, the motors can be direct connected to the machines, and in most cases high speed motors can be used. If d.c. motors are used for this class of service, they should be shunt wound and entirely enclosed, and the starting box enclosed in metallic case lined with asbestos. If the short circuit type induction motor is used for this class of service they need not be dustproof, but the bearings should be dustproof and arrangements should be made to have the sawdust and shavings blown out of the motors at regular intervals and the motors should be provided in large sizes with oil immersed compensators, and in small sizes where they are thrown directly across the line the starting switches should be enclosed in asbestos lined metallic cases. As a general thing motors in the woodworking department should be provided with shaft extensions on both ends, for there are many cases where it is important that each machine be provided with its own blower for carrying away the sawdust. Where machines are equipped in this way with their own individual blowers, a great saving is effected, as the blower is in use only during the time that the machine is in service, whereas if one common blower is used for the whole woodworking department the load is practically the same, whether a few machines are in operation or all the machines in operation. Individual blowers are saving some woodworking departments a steady load of between 40 and 50 h.p.

Motors have been made for almost every conceivable method of mounting: floor, wall, ceiling, vertical and even for back gear drive; they have also been used for belt, chain and rope transmission and also gear drive, and in still other cases the motor shaft has been direct coupled to the driven shaft. Motors have been made of the open semi-closed and dustproof types; they have been provided with bronze, babbitt and ball bearings, and have been furnished of 2 and 3 bearing types. For gear driving, 20 h.p. is about the limit for two bearing motors, and there are some cases where even motors of 15 h.p. should be provided with a third bearing in order to properly support the shaft, for as a general rule standard motor shafts are not heavy enough to stand the shocks met with in gear drives.

In actual practice it has been determined by experiment that the friction loss from engine to tool, where the shop is equipped with line shaft drive, ranges from 30 to 60%, and in some cases the losses have exceeded 60%. The losses in transmitting power electrically from engine to tool in the case of a shop equipped with individual motors for each tool seldom exceeds 30%. But of course this is not the only advantage in the case of the individual motor for each tool. Take the case of a machine shop containing a large number of tools at a time, when one wishes to operate only a few tools, the line shaft and friction losses are practically the same as they are when all tools are in use. While in a shop with each tool provided with its own motor these friction losses are entirely eliminated. Then again, in the case of the shop depending upon line shaft drive, if anything goes wrong with the main belt or line shaft, all the tools are put out of service, while in case of tools equipped for motor drive this does not occur.

Even going back to the prime movers in the case of belt transmission and line shaft drive, there is only one avenue of transmitting the power from the engine to the line shaft, where with electric drive there are, as a rule, duplicate units, and if for any reason one set is put out of service, the auxiliary set is always ready to be put into commission.

There is also the advantage in having the generating station composed of several units so that if anything goes wrong with one unit only a portion of the shop may be shut down. Then, too, this is not always necessary, for generating stations will, as a rule, easily carry 25% overload for a couple of hours and thus give sufficient time in some cases to make necessary repairs. It is almost always necessary to run the steam plant at all times for supplying current for lighting and power at some points in close proximity to the shop, and should the occasion arise where some special job has to be taken care of during the time when the shops are not in actual operation, the current is always available for the motor at any desired point. Engine houses and coaling plants which require power and light can be thus supplied without having a power house installed at these points.

A few years ago, the load factor of railway machine shops was about 19%, and due to the introduction of high speed tool steel and the motor for individual drive the load factor has been raised in some shops to approximately 37%. With the shop equipped with tools for motor drive, the whole shop layout can be rearranged from time to time to suit the various conditions which may arise in the method of handling the different work and also the installing of additional new tools, and it is also possible to take advantage of floor space which in the case of a shop with line shafting it

would be impossible to utilize.

A very distinct advantage that the shop equipped with motor operated tools has over the shop operated with line shafts is that the belts and overhead work are done away with, such shops are lighted much more efficiently and a great deal of danger

is eliminated. In this day of safety first, the elimination of line shaft and belt drive is something that we all should strive for, and in the revamping and extending of our shops, the question of abandoning line shafts and belts should receive very serious consideration.

Report of Committee on Revision of Standards and Recommended Practice.

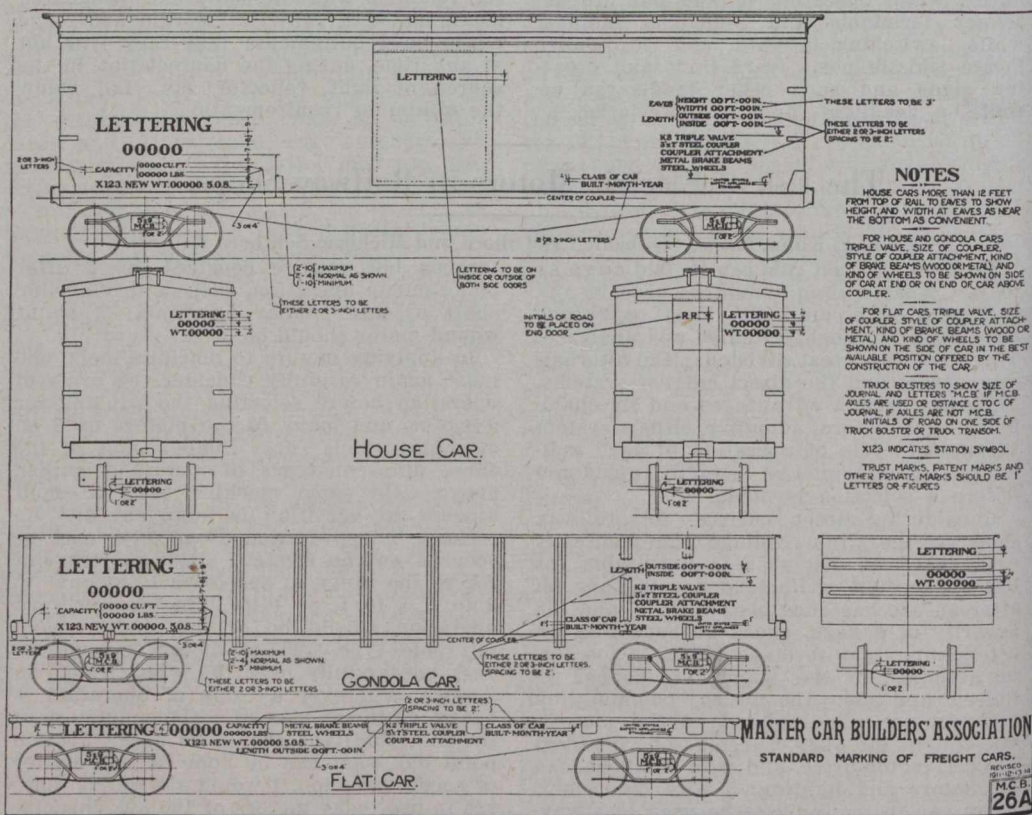
The Master Car Builders' committee, T. H. Goodnow, Superintendent of Car Department, Chicago and North Western Ry., chairman, submitted a report, which is abstracted as follows: It is recommended

That: permission to use skeleton wedges on 5 by 9 in. and 5½ by 10 in. journals be withdrawn.

journal bearing, wedge gauges and dust guard for the 6 by 11 in. journal be advanced from the status of recommended practice to standard.

That the end for the hopper door operating shaft be advanced in status to standard.

That for cars built after Jan. 1, 1915, with 10 in. air brake cylinders for freight cars



Recommended Standard Marking of Freight Cars.

That the brake chain, instead of being preferably 7-16 in. with a ⅜ in. minimum, be made 7-16 in. alone.

That the rear of the coupler yoke be changed to be formed with a ⅞ in. radius at the inside corners, and fitted with a 1 in. filler block, wrought iron or steel, having 1 in. radius ends, the same to be riveted to the back end of the pocket with a 1¼ in. counter-sunk rivet.

That the signal lamp socket be approximately 9½ ft. from the top of rail to the bottom of slot, and so located that the axis of the socket is 45 degrees with the centre line of the car. The variation in the clearances of railways, size of markers and lens, etc., makes it impracticable to recommend a fixed location transversely.

That the accompanying sheet, M.C.B. 26A, covers the new marking of freight cars, and that the information as to marking is permissible with the use of metal badge plates, the letters on which to be not less than 1-16 in. in relief and ⅛ in. bar or staff.

That the journal box lid key for the 6 by 11 in. journal box, be the same as for the 5½ by 10 in.

That the journal box, bearing, wedge, lid,

weighing between 37,000 and 58,000 lbs. light weight, and triples K-1 for 8 in. and K-2 for 10 in. equipment, be advanced to the status of standard.

That the position of the bolting lugs of the air brake hose at the coupling and at the nipple end, as well as the position of the air brake hose label, be advanced to the status of standard.

That the diameters for 33, 36 and 38 in. steel and steel tired wheels be advanced to the status of standard.

The committee considered 43 suggested changes in recommended practice and standards. Of these, the following disposition was made: Not approved, 9; Secretary instructed to make changes or additions, 12; referred to committee on car wheels, 6; referred to committee on car trucks, 1; referred to committee on loading rules, 1; referred to committee on car construction, 1; referred to committee on specifications for test of materials, 1; referred to committee on train brake and signal equipment, 1; and referred to letter ballot for change in standard or recommended practice, 11. All these latter 11 are briefly abstracted in the foregoing.

Report of Committee on Revision of Rules of Interchange.

The Master Car Builders' committee presented through J. W. Taylor, Secretary, a report, reviewing the numerous suggested changes in the rules on interchange, and passing judgment thereon. The more important recommended changes are abstracted as follows:

Rule 1. To make more explicit what is meant by this rule, covering the maintenance of cars on foreign roads in repair, the word "running" is omitted.

Rule 2. This rule as it affects leaking tank cars to be changed to read, "Cars containing inflammable liquid which is leaking, must be repaired or transferred without unnecessary movement, or at nearest available point." Also, that bad order cards be attached to car after lading is transferred, before returning to delivering line, showing thereon the defects and date car was refused.

Rule 3. New rule as follows: "(a) Cars will not be accepted in interchange unless equipped with air brakes having 1¼ in. air brake pipe and angle cocks; also quick action triple valve, pressure retaining valve and an efficient hand brake. (b) Cars will not be accepted in interchange equipped with stem or spindle coupler attachments. (c) Cars built after Oct. 1, 1914, with journals or journal bearings other than M. C. B. standard, will not be accepted in interchange. (d) Cars built after Oct. 1, 1914, will not be accepted in interchange unless equipped with either the no. 1 or the no. 2 M. C. B. standard brake beams and so marked plainly on strut by stamping or casting on. (e) After Jan. 1, 1915, tank cars (empty or loaded) will not be accepted in interchange unless the safety valves are stenciled to show adjusted, etc., within the time limit required by pars. 5, 6 and 7 of the M. C. B. specifications for tank cars. (f) After July 1, 1916, cars will not be accepted in interchange unless stenciled showing month and year originally built. Cars built prior to 1895 may be stenciled 'Built prior to 1895.' (g) After Oct. 1, 1915, no car built for the purpose of carrying products which require the use of salt with ice for the refrigeration of such products will be accepted in interchange unless equipped with suitable device for retaining the brine between icing stations. (h) After Oct. 1, 1916, cars will not be accepted in interchange unless equipped with all metal brake beams. (i) After Oct. 1, 1916, cars will not be accepted in interchange equipped with continuous draft rods. (j) After Oct. 1, 1916, no car will be received in interchange unless the body of the car is marked as provided in rule 86, i. e., either capacity, maximum weight, and on tank cars limit weight no. 1 or limit weight no. 2. (k) If the car has air signal or train line steam pipes, the hose, pipes and couplings are at owner's risk, unless the car is stenciled that it is so equipped. (l) When two or more cars chained together, or any car which requires switch chains to handle them, are delivered at an interchange point, the receiving road shall deliver to the delivering road at the time an equivalent number of switch chains of the same size as the chains so used on the cars delivered, or, in lieu thereof, furnish a defect card for such chains. It is felt that it would be much better to concentrate these special requirements regarding the interchange of cars under one head or rule than to have them scattered all through the book."

Rule 4. Changed to read, "Defect cards shall not be required for missing material in fair usage from cars offered in interchange. Neither shall they be required of the delivering company for improper re-

pairs that were not made by it, with the exception of the cases provided for in rules 35, 56, 57 and 70."

Rule 9. Stem yoke not required to be specified on billing repair cards, as they are not acceptable after Oct. 1, 1914.

Rule 12. Referring to the use of the joint evidence card, add new paragraph as follows: "The joint evidence may be obtained at any point on the home line at which the improper repairs are found, but preferably at the point where the car is received, and only after an actual inspection has been made."

Rule 17. Revised as follows: "(a) In repairing foreign cars: Defective non M. C. B. standards may be replaced with M. C. B. standards (which must comply with M. C. B. specifications), provided such substitution does not impair the strength of car. Any increased cost resulting from and any expense of alteration necessary for the application of such M. C. B. standards shall be charged to the party responsible for the repairs. Any expense of alteration necessary for the application of such M. C. B. standards to be charged to party responsible for the repairs. Scrap credits to be allowed for undamaged parts thus removed. (b) Malleable iron, wrought iron or steel M. C. B. standards may be substituted for each other or for gray iron M. C. B. standards. Gray iron M. C. B. standards applied in lieu of malleable iron, wrought iron or steel M. C. B. standards shall be considered as wrong repairs. (c) In replacing M. C. B. standard couplers or M. C. B. temporary standard couplers, the dimensions of shank and butt of M. C. B. couplers standard to the car must be maintained. (d) If the car owner elects on account of improper repairs to remove M. C. B. standard or M. C. B. temporary standard coupler in good condition, secondhand credit should be allowed, and charge be confined to secondhand coupler applied. (e) When necessary to renew brake beam, any metal brake beam meeting M. C. B. specifications may be used, provided that the beam applied is at least as strong as the beam standard to the car. (f) Billing repair card to specify kind of material applied and removed, and bill rendered in accordance therewith. (g) Cast iron brake shoes may be replaced with brake shoes having reinforced back and the increased cost charged to party responsible for the repairs. (h) White pine, yellow pine, fir or cypress may be used when repairing siding, when of equal grade or quality to the material standard to the car. Fir, oak or southern pine may be substituted for each other in renewing or splicing of longitudinal sills. These changes will discourage the use of non M. C. B. standard material and facilitate freight car repairs."

Rule 18. The date after which cars having couplers with stem or spindle attachments or American continuous draft rods will not be accepted in interchange, is extended from Oct. 1, 1914, to Oct. 1, 1916.

Rule 19. Definitely forbidding the use of malleable iron couplers, open knuckles and malleable or steel backed journal bearings in repairs to foreign cars, and including cast iron brake wheels.

Rule 20. Making compulsory the changing of couplers to standard height.

Rule 21. Making the spreading of car sides, an owner's defect, so that applied transverse tie rods are chargeable to the latter.

Rule 28. Eliminated.

Rule 29. Reworded to read: "When second hand axles are applied, the journals must not exceed ¾ in. over the standard length, and the collar must be not less than

5-16 in. thick. The diameter of the wheel seats or centres, must not be less than, or the diameters of the journals must be at least ¼ in. greater than, the limiting diameters given in rule 86." Balance of rule as at present.

Rule 33. New rule: "The following will not be considered as an owner's responsibility: Straightening or replacing ladders, handholds, sill steps or brake shafts."

Rules 37 and 38. Referring to combination of damages: to be eliminated.

Rule 42. Substitution for the two first foot notes of the following: "When a combination of defects involves decayed parts, or involves longitudinal sills requiring renewal or splicing, due to elongated holes, or to sills split on this account, a joint inspection statement, made as per rule 120, shall accompany the billing repair card, which together will be authority for bill against owner."

Rule 52. To read: "Running boards in bad order or insecurely fastened," owner's defects. "In making repairs to safety appliance details, nails or lag screws must not be used where screws, bolts or rivets are required by law. Handholds or grabirons must be of wrought iron or steel."

Rule 56. Extension of time with regard to rule that after Oct. 1, 1915, cars equipped with brake beams other than metal, will not be accepted in interchange.

Rule 57. Latter part changed to read: "After Oct. 1, 1914, the delivering line will be responsible for hose not conforming with the 1913 M.C.B. standard specifications, and so labelled, except that 1905 M.C.B. specification hose, the date of which shows it was manufactured before Oct. 1, 1914, may continue in service until it is worn out."

Rule 60. With regard to marking of air cylinders and valves, add "Old markings must be erased before new stenciling is applied."

Rule 62. To read: "In replacing air brake hose on foreign cars, new M.C.B. standard 1913 specification hose must be used."

Rule 69. To read: "Broken flange; chipped flange, if chip exceeds 1½ in. in length and ½ in. in width. Broken rim, if tread measured from flange at a point ⅝ in. above tread is ¾ ins. in width, provided these defects are caused by derailment or wreck." Owners responsible.

Rule 78. To read: "Cracked or broken flange, chipped flange if it exceeds 1½ in. in length and ½ in. in width; broken or chipped rim, if tread measured from the flange at a point ⅝ in. above tread is less than ¾ ins. in width; cracked tread, cracked plate, one or more cracked brackets, or broken in pieces, provided these defects were not caused by derailment or wreck." Owners responsible.

Rules 79, 80 and 82. Be made vacant.

Rule 87. To read: "Any company making improper repairs is solely responsible to the owner, with the exception of the cases provided for in rules 3, 56, 57 and 70, and excepting that a company applying axles smaller than the limits given under rule 86 shall not be held responsible for improper repairs if the car is not stenciled showing the capacity or maximum weight, or limit weight I. or limit weight II."

Rule 88. Making obligatory the marking of the improper repairs on the car.

Rule 95. Changing part of rule covering rendering of bills, as follows: "Brake beams, including shoes, heads, jaws, key bolts, cotters, brake pins and hangers, when lost with the brake beam. Brake levers, lever guides, key bolts, pins, cotters, top and bottom brake rods, whether or not they

are lost with the brake beam. Labor and material may be charged for key bolts, cot- ters and brake pins when lost independently of above items."

Rule 105. Adding to rule: "Manufactured articles are those that are not subject to competitive prices, and which can only be obtained from one manufacturer or concern."

Rule 112. To read: "When the body or trucks of a foreign car are destroyed or badly damaged, the owner shall, upon request, furnish depreciated value of body and trucks separately (the same to be figured from the date the car was originally built), and the party damaging shall have the option of rebuilding or settling under the depreciated value. If it is decided not to rebuild, the owner must be immediately advised."

Rule 115. Change end of last paragraph: "Except the second hand value will be allowed for all metal brake beams good for further service and the average credit price for wheels." Abolish reference to damaged steel and steel underframe cars.

Rule 120. To read: "A car unsafe to load on account of general worn-out condition due to age, decay or corrosion, shall be jointly inspected by the handling line and

a representative of the owner of or a dis- interested line, whichever can be most conveniently obtained by handling line. If inspectors agree that the car is unsafe to load on account of general worn-out condition due to age, decay or corrosion, the result of such joint inspection, entered on a form, shall be sent to the car owner, showing in detail all defects found on car, also an estimate of the cost to rebuild the car. Upon receipt of this information the owner must either authorize the destruction of the car, or authorize the handling company to re- build it. In the latter case the owner must forward to the handling company complete plans and specifications necessary for the rebuilding of the car. If the owner elects to have the car destroyed, the handling line shall allow credit for all material at M.C.B. scrap prices, less labor cost of destruction."

Rule 121. Be made vacant.

PASSENGER CAR RULES.

Rule 3. To read: "Equipment and tools missing from the inside of baggage, mail and express cars are at owner's responsibility."

Rule 17. To read: "All inside or concealed parts of passenger equipment cars are at owner's risk."

Report of Committee on Brake Shoe and Brake Beam Equipment.

The Master Car Builders' Committee, C. H. Benjamin, Professor of Railway Engineering, Purdue University, Lafayette, Ind., reported in part as follows:—

BRAKE SHOES.—Tests were conducted upon the M.C.B. brake shoe testing machine. The shoes tested were of 6 different kinds, selected from the 7 kinds reported in 1911, each as follows:—

Two plain cast iron, received from the Pennsylvania Rd., length on arc, 14 ins.; width, 3 3/8 ins.; thickness, 1 1/2 in.; no insert; reinforced with steel back. Two Spear- Miller, received from the Chicago, Burlington and Quincy Rd., length on arc, 13 1/2 ins.; width, 3 3/8 ins.; thickness, 1 3/4 in.; two V-shaped inserts; reinforced with a steel back. Two National, received from Chicago, Milwaukee and St. Paul Ry., length on arc, 14 ins.; width, 3 3/8 ins.; thickness, 1 5/8 in.; chilled ends, and reinforced with a steel back. Two Diamond S Christie, also known as a half-flange type, having a flange of 2 1/2 ins. at each end of the shoe, received from the Southern Pacific Rd., length on arc, 14 ins.; width, 4 ins.; thickness, 1 1/2 in.; insert composed of a bundle of expanded metal, covering the entire face; reinforced with a steel back. Two U shoes, received from the New York Central Lines, length on arc, 15 3/4 ins.; width, 3 3/8 ins.; thickness, 1 3/8 in.; ends tapered and chilled; reinforced with a steel back. Two Pitts- burg, from Pennsylvania Rd., length on arc, 14 ins.; width, 3 3/8 ins.; thickness, 1 3/8 in.; made up of a pressed back, 1/2 in. thick, completely filled with a composition filler.

Each shoe was tested upon a steel-tired wheel under the following brake shoe pressures:—12,000, 14,000, 16,000 and 18,000 lbs., the initial speed of the machine being in each case 65 m.p.h. At each of the above pressures nine stops were made.

In anticipation of a test the shoe was given a number of applications until a full bearing surface was obtained, after which it was accurately weighed upon a pair of scales. The shoes were first tested at a pressure of 12,000 lbs., after which the pressure was increased by increments of 2,000 lbs. until a pressure of 18,000 lbs. was reached, or until the shoe broke or became unserviceable. The loss

in weight of the shoe was obtained by weighing the shoe after each three appli- cations, thus giving a check upon the loss for each pressure. Between each applica- tion the shoe was cooled by a blast of air until the temperature was reduced to such an extent that the observer could bear his hand upon the shoe.

The results are plotted in figs. 1 to 3. It will be seen from fig. 1 that the co- efficient of friction of most of the shoes

the 18,000 lbs. pressure. Two of the types, the Diamond S and the Pittsburg, showed a tendency to reduce the wear as the pres- sure was increased up to 16,000 lbs., but increased at 18,000 lbs. pressure. No doubt this reduction in loss was due to a change in the per cent. of insert in contact or a change in the physical makeup of the shoe.

It will be seen from a study of fig. 1 that the coefficients of friction of five of the different types of shoes tested fall some- what close together, but not nearly so close as they did in the tests conducted at 80 m.p.h., reported in 1911. In 1911 the varia- tion was less than 2 in the value of the co- efficient of friction in per cent. at any pres- sure for all shoes tested, with the exception of the Pittsburg. From the results reported this year at 65 m.p.h., it will be seen that this variation is considerably more, being as much as three or over at the different pressures. The coefficient of friction in 1911 was never over 10% nor under 7%, an average for all shoes with the exception of the Pittsburg being approximately 8.4, while in the tests this year at 65 m.p.h. the maxi- mum was 13.3 and the minimum 10% for all but the Pittsburg. The average coefficient of friction at 65 m.p.h. was 12.2, thus making it greater by 3.8 than it was at 80 m.p.h. The Pittsburg in 1911 at 80 m.p.h. varied in a straight line from 19.75% at 12,000 lbs. to 17.1% at 18,000 lbs. It will be seen from the tests made this year that the coefficient of friction of this shoe was less at 65 m.p.h. than at 80 m.p.h. It will also be noted that the loss of weight in the Pittsburg was more at 65 m.p.h. than at 80 m.p.h. In 1911, the average loss at 80 m.p.h. was 2.8, while this year the results at 65 m.p.h. showed a loss of 3.2. This apparent inconsistency in the coefficient of friction and loss in wear of the Pittsburg may be accounted for by the fact that the shoe is made of a composition filler, and as the

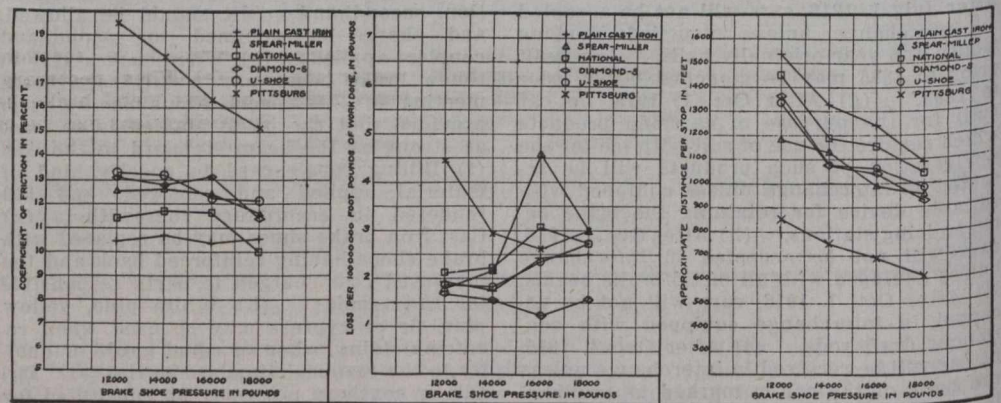


Fig. 1.—Average Co-efficient of Friction of Each Kind of Shoe. Fig. 2.—Average Loss per 100,000,000 ft.-lbs. of Work Done for Each Kind of Shoe. Fig. 3.—Approximate Distance per Stop in Feet for Each Kind of Shoe.

decreased as the pressure increased, the two exceptions to this being the plain cast iron and the National. The plain cast iron gave almost the same coefficient at all pressures, while the National gave almost the same coefficient at the three lower pressures and then made a sudden drop at 18,000 lbs. The loss in weight, due to wear, fig. 2, shows that in the case of four of the different types of shoe tested, the loss increased as the pressure increased up to 16,000 lbs. With two of the kinds of shoes tested the loss reduced at 18,000 lbs. This seemingly inconsistent result may be accounted for by the fact that two of the shoes, National and Spear-Miller, broke during the tests at 16,000 lbs., increasing the wear for a time at least, and possibly decreasing the wear when the broken shoes had again been worn to a new fit before

shoes have been lying in the laboratory for three years where the temperature was 70 degs. or more, the binder which holds the filler together may have dried out, thus reducing the coefficient of friction and in- creasing the wear.

The results given in fig. 3 show that the approximate distance per stop was inversely proportional to the coefficient of friction, all of the metallic shoes varying about the same as for coefficient of friction, and this variation is greater at 65 m.p.h. than at 80 m.p.h., as in 1911. The Pittsburg made stops at approximately half of the distance required by the poorest metallic shoe.

BRAKE BEAMS.—The following change in specifications for no. 2 brake beams is recommended: Apply an initial load of 12,000 lbs., then reduce to 500 lbs.; reset the deflection instrument to zero. Apply a

test load of 12,000 lbs. and under this load measure the deflection, which is desired to be 1-16 or 0.0625 in., but should not exceed 0.07 in. The beam must then be loaded to 24,000 lbs., after which the set shall not exceed 1-100 in. The brake beam shall stand a total motion of the head of the machine of not less than 2 in. without failure at any point. This change is recommended because it is more in accordance with engi-

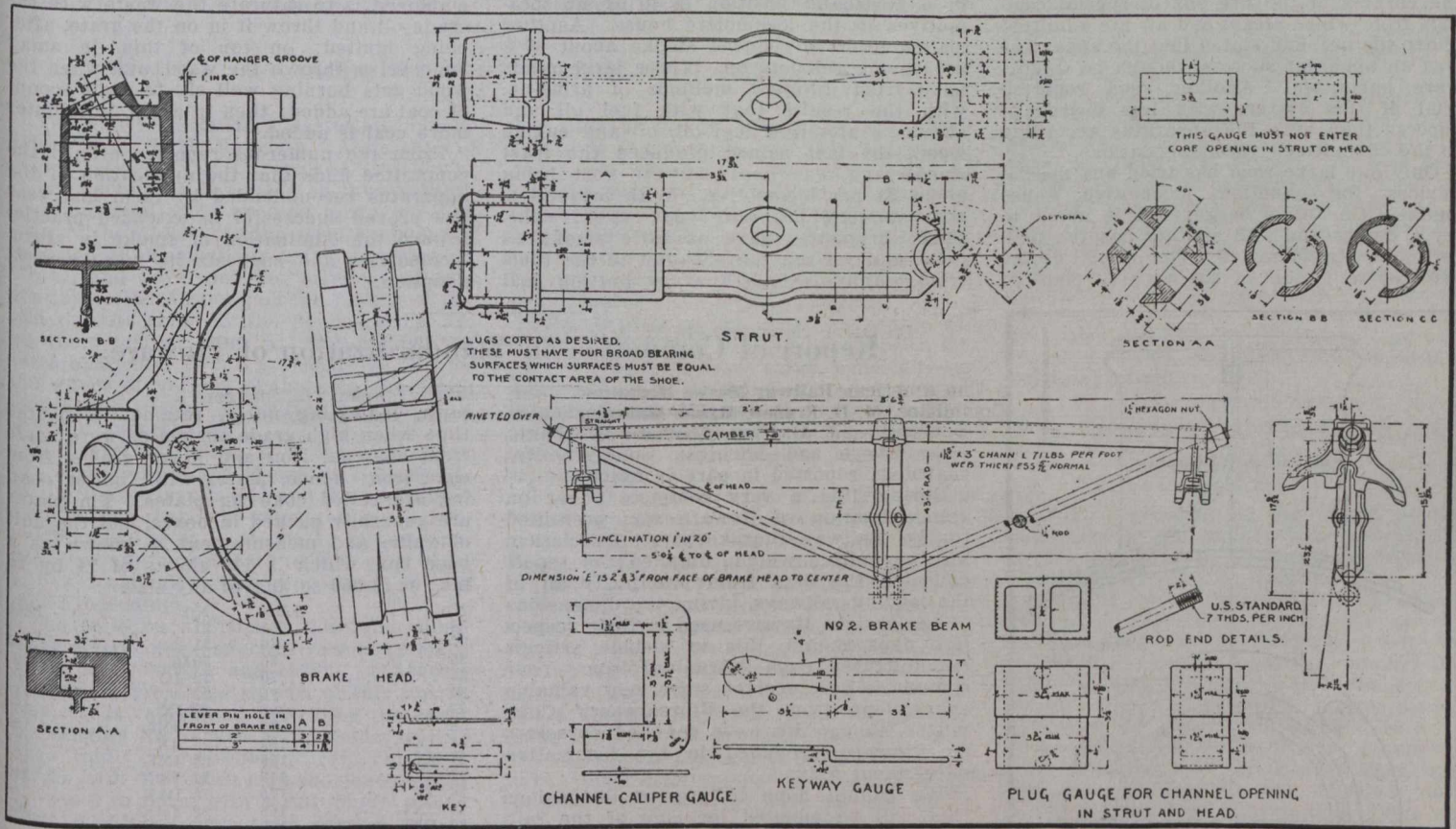
portant members should be added to the other specifications, but that specifying a minimum weight would not be sufficiently definite.

The subject of a standard no. 2 brake beam for recommended practice was reopened by a letter of inquiry, which, with replies, is as follows:

Is it desirable at this time to adopt a standard no. 2 brake beam as recommended

sider it inferior to some now in use. It is recommended that this beam be adopted as recommended practice.

About 75% of the defective brake beams found on the Pennsylvania Rd. were removed on account of worn brake heads, indicating that if beams were properly hung and the locations for hanger holes and hanger brackets were standardized, a large number of failures could be prevented.



Sheet M. C. B. 17B Recommended No. 2 Standard Brake Beam with Details.

neering practice to determine the strength and stiffness of structures at or below the elastic limit rather than to determine the load which will produce actual failure or destruction, it being understood that no part or structure will safely withstand repeated stresses above the elastic limit. It is apparent that the latter forms the proper criterion for safety. It is assumed in the above specifications that 12,000 lbs. represents the maximum working load and 24,000 lbs. the load corresponding to the elastic limit of the beam, corresponding respectively to approximately 15,000 and 30,000 lbs. fibre stress.

Consideration of the desirability of adding to the specifications a limitation as to the minimum weight of heads and struts allowable show a considerable variation in weights of struts and heads, due largely to variations in design. The Pennsylvania Rd. reports 9 lbs. for the head and 11 lbs. for the strut as a fair average. The list furnished by a firm which supplies nearly half a million brake beams to nine different railways shows head varying from 9 to 11 lbs. each and struts varying from 9 to 12 lbs. each, with an average of about 10 lbs. for either head or strut. Prof. L. E. Endsley has called attention to the fact that, while the average distance between compression and tension members is about 12½ ins., there is some variation in this length which would affect the strength of the strut. In other words, longer struts would need a greater weight for the same strength.

It is believed that some specification which shall define the strength of these two im-

practice? 22 yes; 8 no. If so, would you consider the beam in sheet M.C.B. 17-B a suitable standard for this purpose? 19 yes; 11 no. If you deem the proposed standard unsuitable, please indicate your reasons. 5 prefer the use of present standard dimensions and see no need of standard detail; 5 do not like the design proposed, and con-

Failure of the compression and tension members is further shown to be due largely to poor fits between the heads and struts and the other members. In other words, it is apparent that a more careful standardization of brake beams would result in a much smaller percentage of failures and much less expense to the railway companies.

Report of Committee on Smoke Prevention.

The American Railway Master Mechanics' Committee, E. W. Pratt, Assistant Superintendent of Motive Power, Chicago and North Western Ry., chairman, reported in part as follows:

A set of five questions was submitted to members, and answers were received from 25 lines, representing nearly 32,000 locomotives.

Four roads having 4,000 locomotives have complete equipment according to M. M. recommendations and are having excellent results. Seven have installed no devices, one on account of using fuel oil entirely. One finds no particular value in the quick opening blower valve as a smoke reducer, but agrees that the other recommendations are smoke reducers. One, after extended tests of quick opening blower valves, finds that the smoke can be eliminated 33% quicker with such valve in use, and as a result of its tests it has decided to adopt quick opening blower valves. Several others agree that its use is effective, especially when unexpected stops are made. Fifteen with about 18,500 locomotives have installed

jets and consider that with ordinary handling these are undoubted smoke reducers. Side installations appear to be more in favor than back head, and are also less expensive; one large road considers that with side installations the jets nearest the front of the fire box are most effective. Two with over 1,000 locomotives, report that arches effect a smoke reduction while working, but produce no noticeable effect while standing. One with over 1,800 locomotives reports the application of side jets and blower to all its locomotives switching or running into Chicago, and the extension of such application to all switchers and a large proportion of all road locomotives on its entire line; the quick opening blower valve was applied to only a small portion of these.

Only seven roads, with about 10,000 locomotives, have tried any special devices other than those recommended. Two refer to a different style of arch with a combustion chamber; one considers that the mechanical stoker which it is using, when working properly, is an excellent smoke reducer. Two have tried other devices without success.

One, with about 1,600 locomotives, reports considerable success with the Bates baffle fire door and Heffron draft regulator. Another large road has attained considerable success by using a ring blower at the top of the stack; claim is made of almost complete elimination of the smoke on the road and the prevention of smoke trailing into the cab; cost is about \$7.75; the device is shown herewith. One reports the application in the corners of the fire box of special castings from which steam and air are admitted above the fire, and stated that the apparatus was an apparent success, though no figures were submitted. Another road reported trial of this system with less degree of success than with the apparatus according to the committee's recommendations.

Only one large road has tried any special devices for handling locomotive house smoke. One other large road is about to try a device and still another has the matter under consideration. The special device referred to is the smoke washing plant of

Schmidt superheater appears to be in almost universal use, a few Cole superheaters being the only other ones reported. The fuel economy of the superheater varies from 12 to 35%. One important road reports a saving of as high as 40% in the average number of pounds of coal used per car handled in switching service.

One road reports smoke reduction by the use of a ring blower hung inside the stack in a horizontal position in firing up locomotives in the locomotive house. Another claims to have reduced smoke about 30% by leaving the jets on. Three large roads have tried different methods of firing-up, with the results that with fuel oil and shavings, atomized fuel oil, oil and engine wood, the last named produced the least smoke and was cheapest, the cost being about \$1 per locomotive. With briquettes, cost about \$1.50; soft coal, \$2.09; coke, \$4.26; briquettes gave as little smoke as coke, and yet are the cheapest of the fuels tried. Another finds that by putting coal

on the grates and wood on top that less smoke is produced, but cost figures were not given, and it is believed that this method is more injurious to the grates, especially with coal that clinkers badly. Another large road, after considerable investigation, has adopted firing-up with scrap waste, crude oil, wood and coal in quantities, waste, 1 lb.; crude oil, 1/2 pt.; old car siding, 1/2 cord; coal, 300 lbs.; the method employed is to saturate the waste with the crude oil and throw it in on the grate, after being ignited; on top of this, in small bunches, is thrown the wood, and when the wood gets burning well six to eight scoops of coal are added; then in about 30 minutes more coal is added.

From the numerous reports outlined the committee finds that the application of the apparatus recommended by them last year has proved successful in extended practice toward the elimination of smoke in steam locomotives and suggests its more general adoption.

Report of Committee on Standardization of Tinware.

The American Railway Master Mechanics' Committee, M. D. Franey, Master Mechanic, Lake Shore and Michigan Southern Ry., chairman, reported in part as follows:—

During 1911 a very complete paper on standardization of tinware was presented to the Railway Storekeepers' Association. The committee which compiled the report collected the data from practically all of the leading railways, giving the dimensions of the various tinware used in their respective departments, this to include articles manufactured from galvanized iron. Your committee has received some very valuable suggestions from the Storekeepers' Committee, though we have confined ourselves to tinware included in the locomotive department only.

We cannot hope to present dimensions that will be adopted by each of the railways. Many now have their standards; for various reasons they do not wish to depart from them. There are railways, however, that have not adopted a standard, and while the committee has studied principally the method of construction and the material to be used, it has also selected the dimensions that in its judgment will be most suitable for the service for which each article will be used. This is probably as close as we can ever expect to come to a standard on tinware. As an illustration, it is well known that a tank bucket has to withstand very severe usage. For this reason your committee is recommending a tank bucket with a bottom of very small diameter, designed with a specially formed wire guard fastening the bottom in place. The bottom of the bucket is also depressed so that it can set over a projection without injury. This form of construction will very successfully withstand the service and the force of a blow to which the tank bucket is subjected.

Your committee has endeavored to reduce the number of articles used to a minimum, and it finds that a number of roads get along with the articles mentioned in this report. It has not included headlights, cab lamps, lanterns or markers, as it finds most roads purchase these articles from manufacturers. Very few railways have detailed drawings of these articles, or manufacture themselves. It might be of interest to review some of the commercial terms applied to the tin used in construction. The plates are referred to as coke tin, charcoal tin and terne plates.

COKE TIN PLATES.—The base of these plates is the best soft steel, made especially for tin plating. The word "coke" is a trade

term, indicating finish, retained from the time when high grade tin plates were made from charcoal iron and lower grades from coke iron; hence, plates with lighter coating are called coke tin plates. Tin plates are generally packed in boxes, and the unit of value and measurement is known as a base box, which is 112 sheets of 14 by 20 ins., or 31,360 sq. ins. of any size.

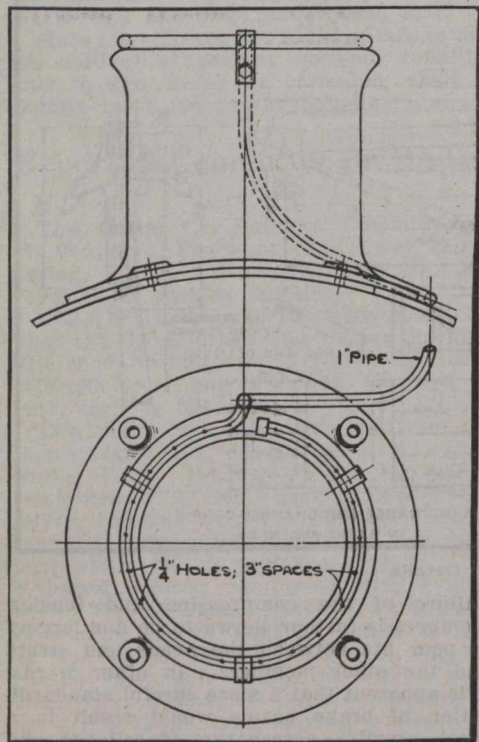
No.	Lbs.	No.	Lbs.
38	55	31	90
37	60	31	95
36	65	30 1/2	100
35	70	30 IC	107
34	75	29	118
33	80	28 IX	135
32	85	28 IXL	128
28 DC	139	25 4X	195
27 2X	155	25 4XL	188
27 2XL	148	24 D2X	210
26 3X	175	23 D3X	240
26 3XL	168	22 D4X	268
26 DX	180		

CHARCOAL TIN PLATES.—The base metal of these plates is specially prepared with a view to securing a high gloss and fine working quality. The trade term "charcoal" is referred to in the description of the coke finish. It is customary to distinguish the amount of coating and degree of finish by letters 1-A, 2-A, etc., up to and including 5-A. 1-A grade has the least amount of coating, and each A signifies an additional quantity. One of the leading manufacturers gives the following tabulation for various brands, showing the approximate weight of coating on both sides of the sheet per base box of 112 sheets, 14 by 20 ins.; for 112 sheets, 20 by 28 in., the weight of coating would be double that shown in the table:

1-A Charcoals	3 lbs.
2-A Charcoals	3 1/2 lbs.
3-A Charcoals	4 lbs.
4-A Charcoals	5 lbs.
5-A Charcoals	6 lbs.
Premier	7 lbs.

It recommends the Premier brand as suitable for all high-class work, such as nickel plating.

TERNE PLATE, generally known as roofing tin, is made by coating steel or iron sheets with a mixture of approximately 25% tin and 75% lead. These plates are made from copper bearing open hearth steel. The manufacturers claim that steel of this character amalgamates with the tin and lead mixture in such a manner as to produce a better plate than is possible with ordinary steel, and as a consequence resists corrosion to a remarkable degree. It is also as soft as the best charcoal iron. Practically all of the roofing tin made prior to 1890 was produced by the palm oil process, but it is



Smoke Lifting Blower.

the Lake Shore and Michigan Southern Ry. at the Englewood locomotive house, Chicago. As this smoke washer was installed in the nature of an experiment, it is impossible as yet to give reliable figures on the cost of such a plant or its operation.

Three large roads, having about 4,500 locomotives, consider that there is no reduction of smoke, due to the superheater alone, all other conditions of operation being the same. Two believe that when locomotive is properly worked, less smoke will be produced with a superheater than without it; this is merely an opinion and not the result of scientific observation. Five believe that there is a reduction in smoke corresponding to the reduction in coal burned. Tests were conducted by the Pennsylvania Rd. at the Altoona testing plant, with both freight and passenger locomotives equipped with superheaters against the same type of saturated steam locomotives. The superheater in freight service effects an undoubted reduction in smoke under the same working conditions. In passenger service, however, a superheater produces more smoke at the low burning rates, while there is a reduction in smoke at the high burning rates. The

claimed that plates made in the 90's by the acid process are still in use and giving good service, manufacturers claiming they are fully as good. It is important that the mixture covers the iron and adheres to every point; otherwise, there are liable to be what are known to the trade as pinholes, which are injurious and permit corrosion to start. Terne plates, like the other grades, are packed in boxes which show the style of finish, the grade of the plate and the amount

of coating. The process of manufacturing does not produce all perfect sheets, which are designated by the mill as prime plates. A small percentage of the manufactured plates contain pinholes or other defects, and are called wasters.

The report terminated with a series of drawings and descriptions of 20 standardized parts, including the following, in some cases in different sizes; Engineer's torch, oil cans of different kinds, card case and buckets.

Report of Committee on Superheater Locomotives.

The American Railway Master Mechanics' Committee, H. H. Vaughan, Assistant to Vice President, C.P.R., reported as follows:

The committee has made an investigation in connection with packing rings, etc., in view of the widely varying results which are reported in locomotives using superheated steam, and have also the privilege of presenting to the Association the results of the experiments made by the Pennsylvania Rd. on their testing plant at Altoona, on the tests of a class K 2, s a locomotive and on the effect of various changes in the form, length and extent of heating surface of a Schmidt superheater.

The test on a class K 2, s a locomotive has been printed and issued as Bulletin 18, by the Pennsylvania Rd., and the committee recommends that it be reprinted in the Proceedings of the A. R. M. M. A., in the same way that the report on the test of a class E 6 s locomotive was reproduced in the 1913 Proceedings.

The tests on a Schmidt fire tube superheater showing the effect of various changes in its form, length and extent of heating surface are presented as part of this report. This test is valuable as indicating the effect of changing the length of the superheating pipes, and the possibility of obtaining results with the return loop shortened which are equal to those with a full length return loop. The tests have been carried out in the thorough manner usual on the Pennsylvania Rd., and this Association is indebted to their general superintendent of motive power, Mr. Wallis, for permission to present them.

In connection with packing rings, 20 roads were written operating about 5,500 superheater locomotives, and the replies may be summarized as follows:—There is a large variation in the life obtained from piston packing rings, the replies giving from two or three months of 6,000 miles, to as high as 50,000 miles or two years. Roads representing about 25% of the locomotives use a special mixture for piston packing rings, but while most of those who do so report from 50 to 100% longer service from special irons than from ordinary gray iron, the latter is used by those roads reporting the longest life in service. In several cases cylinder iron is used with 1.20 to 1.50% of silicon—the phosphorus also being kept low, not over 0.5%, and with apparently good success. There is, however, considerable variation between different classes of engines, in some cases the life reported in passenger service being double that in freight, while in other cases the reverse occurs. The longest life reported is with the plain $\frac{3}{4}$ in. square ring which is used by the majority of the roads; but one road using $\frac{3}{8}$ in. by $\frac{5}{8}$ in. rings reports a decided improvement as against the $\frac{3}{4}$ in. wide ring, and exceedingly good results are reported by the Leighton balanced ring, which is a special design and used by the Illinois Central.

The great variation in the life is peculiar, as there does not appear to be any explanation of the wide differences reported.

The average life for all locomotives represented is five months, and this figure compares very closely with results reported by several roads that have gone into the matter carefully. It is generally suggested that ample lubrication and the use of the drifting throttle are the requirements for long life, but apart from these suggestions there is nothing to explain the variations.

The majority of the roads have used extended piston rods to some extent with improved results in most cases, especially on large cylinders, 23 in. diameter and over. Replies would indicate that if of proper design this attachment is undoubtedly an advantage, the only question being one of maintenance.

The life of piston valve rings also shows a wide variation from as low as two months to as high as two and even three years. There is no correspondence between the life reported for piston packing rings and valve rings, in many cases roads reporting a long life for piston rings, reporting a short life for valve rings and vice versa. The average life reported is slightly over 13 months. It is apparently but slightly affected by the material used, but several roads refer to the necessity of boring out the bushing in position to obtain good results. Very little trouble is experienced in the case of piston valve bushings and there is evidently no serious difficulty in the maintenance of these parts.

Most roads use special types of rod packing, and with a good design there seems to be no difficulty in obtaining a life of 10,000 miles or over, with the 80% lead, 20% antimony mixture. Where this has given trouble on account of severe service and on the high pressure cylinders of Mallet engines, a mixture of 50% copper, 50% lead has been used to advantage. One road reports improved results on Mallet engines from a mixture of 33% copper, 67% lead, but the 80-20 mixture is the one most used and is evidently satisfactory in the majority of instances.

W. H. FLYNN, Superintendent of Motive Power, Michigan Central Rd., in the course of the discussion, said:—We have been safe ending the superheater tubes and getting excellent results from them. We build in one locality safe ending in the front end and in another the rear end, but for economic and other reasons we decided to weld only on the front end. On one division where we have continuous, high speed service we have been endeavoring to find something that will improve the service obtained from our cylinder packing. At the present time we are experimenting with graphite lubrication in conjunction with oil lubrication, and our results so far have been very gratifying.

E. R. WEBB, Master Mechanic, Michigan Central Rd., St. Thomas, Ont., said:—With superheater locomotives, and in that heavy, high speed service, we found it was necessary to inspect the packing every 30 days, and one of the amusing things that was found was that the cylinders did not wear;

the wear seemed to all come on the packing and pistons. We use a $1\frac{1}{4}$ in. packing, 15-16 or 31-32 in. wide. It was found also, in the use of the Dunbar packing, with both the square and the other section, that the wearing surfaces would be of the same dimensions. I believe that it will be found that where the packing runs ordinarily more than 15,000 or 16,000 miles the temperature of the superheater is not very good for it. As regards the cylinder lubrication, we believe it to be necessary on superheater engines. With the graphite lubrication, we found that cracked piston rods have practically disappeared. The examinations which the superheaters receive in the roundhouse are what determine whether they shall be successful or not. It has been found that it is quite necessary to keep the flues open to inspect the front ends and to keep the boiler tight. The superheater has made it possible to operate our service with a 22 in. by 26 in. engine, that otherwise could not possibly handle the business. The man who cleans the flues and the man who calks the flues—the men who take care of these things are really the important and vital fellows.

H. H. Vaughan on the Car Construction Committee's Report.

In the discussion of the report of the committee on car construction (see pg. 294 of this issue), H. H. Vaughan, Assistant to Vice President, C.P.R., said:—

I advised the chairman, Mr. Kiesel, that I realized it was unfair at the time the report was written to interpose objections, but in some respects I did not consider the report satisfactory. My objections are as follows: I cannot subscribe to the recommendation on centre sills for new cars. I am inclined to agree that the two standards I recommend would not be practical, and therefore consider that the decision must be left to each road individually. From experience gained with 30,000 cars, having 19.8 sq. ins. of centre sill area, I do not consider results would warrant this area being increased for the class of traffic in which these cars are usually employed, while roads on which exceedingly heavy trains are handled may find it desirable to employ heavier construction at the expense of heavier dead weight. Until the time arrives at which interchange requirements demand a minimum strength of centre sill, it therefore appears useless to specify the dimensions for new cars.

End construction for new cars with two vertical 4 in. Z bars and $1\frac{1}{4}$ in. wood end lining has proved satisfactory, and is ample as a minimum requirement. I would therefore recommend the report be amended to read "New steel cars should have steel plate ends $1\frac{1}{4}$ in. thick, or wood lined ends $1\frac{1}{4}$ in. thick," etc., and that the statement regarding alternative arrangement be omitted. Bending strength of the braces should be specified at a definite height above floor line. It is unnecessary to provide end fastenings which are equal to the shearing strength of the braces.

I do not consider it desirable to specify patented type of ends, as these could better be provided for by saying that special design of ends should be equal in strength.

Under the heading of Car Doors and Fastenings, angles should be located not over 12 ins. from top and bottom of door to provide for construction in which these angles or their equivalent is used as part of door frames. They should be used with $\frac{3}{8}$ in. carriage bolts, or $\frac{1}{4}$ in. rivets.

The recommendations on draft gears should permit cars to be transhipped at option of receiving road in place of forbid-

ding their acceptance in interchange. The draft timbers should be held securely to the centre sills, end hills and dead wood by not less than six 7/8 in. bolts or five one inch bolts. Size of draft springs should be specified in place of capacity. I consider that a clause should be drafted specifying the condition of draft gear and sills, as this is more important than the dimensions. I do not consider that recommendations for repairs are advisable, as it is not apparent what object would be attained by them.

JAS. COLLEMAN, Superintendent, Car Department, G.T.R., said:—There are some railways which have a large number of cars with less area than required by this report, and I do not think it is fair to adopt this report, as it would almost cripple some of the railways which have a large number of these cars in service.

H. H. VAUGHAN, after some further discussion, said:—I think the report of the committee should be received, and I would be very glad if the association would receive my report as a minority report. The report as a whole demands varied action. As to some portions relating to the minimum strength of draft gear on cars in interchange, that portion should be referred to the arbitration committee for their consideration. Another portion of the report, the strength of centre sills on new cars, may be submitted to letter ballot as recommended practice. I do not think any action should be taken on the report as a whole.

And further on in the discussion Mr. Vaughan said:—It may be that referring this report to letter ballot for adoption as recommended practice will make a progress report for it, but it also does something more: it puts the stamp of approval of the association on certain required limits for new cars, and any road that builds cars which do not come up to that minimum is more or less subject to criticism. Four years' experience with cars having two 15 in. channel centre sills, properly reinforced with a bolster, but without a continuous cover plate, has shown excellent results in service, and the cars have not sustained sufficient damage in interchange service to justify us in adding 500 lbs. of weight. I have figured that 500 lbs. of added weight adds \$6 a year to the cost of pulling the car around. I do not want to add that cost unless it is necessary, and I cannot see that it is at the present time.

C. E. CHAMBERS, Central Rd. of New Jersey, took issue with Mr. Vaughan as to the matter of cars in service of four years. He did not think that sufficient time in which to decide whether a car was strong enough. During that time the sills had not commenced to deteriorate, but during the next four years there might be considerable weakness displayed in them.

Finally it was decided to refer the paragraphs under discussion to the incoming executive committee to dispose of.

The Use of Electric Motors in Railway Shops.

In delivering at the A. R. M. M. convention the individual paper on this subject, which appears on pg. 307 of this issue, two of the Michigan Central Rd. officials referred to its new shops at St. Thomas, Ont.

E. R. WEBB, Master Mechanic, St. Thomas, said: Being connected with probably the very latest new shops that are being electrically equipped, I can certainly agree with all of the statements in the paper. We find that in going from the shaft drive to the individual motor drive, and from the group drive to the individual drive, the advantage is very great.

W. H. FLYNN, Superintendent Motive

Power, Detroit, said: We have recently built a new shop, which is electrically equipped throughout. We have had considerable experience with electricity in our shops at Jackson, Mich., but our first installation there was the group system. Since that time we have recognized the disadvantage of the group system, which entailed the use of a lot of belts, and our later purchases have been largely confined to individually driven machinery. In our St. Thomas shops we have gone to the individual group system to a slight extent, partly from the standpoint of economy, and partly also from an economical arrangement of the tools, but in large installations I am in favor of the individual system. We have had an experience in building a new shop, and also trying to modernize a car shop by using electricity and centralizing the power into one power plant, and benefits are already apparent. We are going to operate one power plant at a less cost to supply a considerably greater amount of power than we previously operated two power plants.

J. K. DEVOY, Chicago, Milwaukee and St. Paul Ry.: Has Mr. Flynn any information as to what he has saved by changing from group to individual drive, and if he has made up his mind as to how low he would go in size of a motor for individual machines?

W. H. FLYNN: We have been governed largely by the results which we have obtained, and while we have not any definite recommendations to make at this time, we are studying that now. We find that some small machines, where they are running constantly, can be grouped and run by a 7 or 10 h. p. motor, with very economical results, but we ran up against the question of power factor at Jackson. We were getting very poor results and we found it necessary to make some changes in grouping, abandoning some of the group drives in order to get more efficiency.

Disposition of Committees' Reports [at Atlantic City.]

MASTER CAR BUILDERS' ASSOCIATION. The reports of the committees on rules of interchange, prices for labor and material, coupler and draught equipment, overhead inspection of box cars, and damage of freight car equipment by unloading machines, were approved in full.

The reports of the committees on car wheels, loading rules, car trucks, train lighting, tank cars, specifications and tests for materials, car construction, and retirement of 40,000 and 50,000 capacity cars were accepted, to be referred to the members by letter ballot.

The reports of the committees on brake-shoe and brakebeam equipment, revision of standards and recommended practice, and train brake and signal equipment, were amended, and will be referred to the members for letter ballot.

The report on car construction was referred to the incoming executive committee, to dispose of the paragraphs to which exception was taken by H. H. Vaughan and others.

L. C. Ord, Assistant Master Car Builder, C.P.R., Montreal, took part in the discussion of the report on train brake and signal equipment, and moved that sec. 3, concerning the cording of conductors valves, be referred back for further consideration. This and other amendments carried.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION. The reports on locomotive stokers and locomotive head lights were adopted.

The committee on standardization of tinware was continued and requested to bring in a report next year with recommendations

for standards for all classes of tinware now in use.

The report on train resistance and tonnage rating was referred back to the committee for further investigation.

The reports on smoke prevention and fuel economy were adopted, and the committees were both continued and made standing committees.

The report on revision of standards and recommended practice was referred to letter ballot, with the exception of the sections on maximum and minimum flange, thickness, gauge and rearrangement of specifications, which were referred back to the committee for further action next year.

The report on laboratory and road tests for locomotives was referred to letter ballot for recommendations as to standard practice.

In connection with the report on train brake and signal installation, which was also submitted to the M.C.B. Association, similar action was taken by both associations, it being decided to omit the questions and answers from the proceedings, that the air brake and train signal instructions be submitted to letter ballot and that the new train signal be returned to the committee for further investigation.

Election of Railway Mechanical Associations' Officials.

The following elections took place at Atlantic City:

Master Car Builders' Association.—President, D. F. Crawford, General Superintendent of Motive Power, Pennsylvania Rd.; First Vice President, D. R. MacBain, Superintendent of Motive Power, Lake Shore and Michigan Southern Ry.; Second Vice President, R. W. Burnett, General Master Car Builder, Canadian Pacific Ry.; Third Vice President, C. E. Chambers, Superintendent of Motive Power, Central Rd. of New Jersey; Treasurer, J. S. Lentz, Master Car Builder, Lehigh Valley Rd.; Executive Committee, R. E. Smith, General Superintendent of Motive Power, Atlantic Coast Line Rd., J. C. Fritts, Master Car Builder, Delaware, Lackawanna and Western Rd., and H. T. Bentley, Superintendent of Motive Power and Machinery, Chicago and North Western Rd.

American Railway Master Mechanics' Association.—President, F. F. Gaines, Superintendent of Motive Power, Central of Georgia Ry.; First Vice President, E. W. Pratt, Assistant Superintendent of Motive Power, Chicago and North Western Rd.; Second Vice President, W. Schlafge, General Mechanical Superintendent, Erie Rd.; Third Vice President, F. H. Clark, General Superintendent of Motive Power, Baltimore and Ohio Rd.; Treasurer, Angus Sinclair, Editor, Railway and Locomotive Engineering; executive members for two years, C. F. Giles, Superintendent of Machinery, Louisville and Nashville Rd., M. K. Barnum, General Mechanical Engineer, Baltimore and Ohio Rd., J. Purcell, Assistant to Vice President, Atcheson, Topeka and Santa Fe Ry.

Railway Supply Manufacturers' Association.—President, J. W. Johnson, Pyle National Electric Headlight Co.; Vice President, O. F. Ostby, Commercial Acetylene Railway Light and Signal Co.; Executive Committee, Third District, C. E. Postlethwaite and P. J. Mitchell, Fifth District, G. H. Porter, and Sixth District, F. E. Beal.

The Palliser, the C.P.R. hotel at Calgary, Alberta, was opened for business June 1. It has 315 rooms for guests, of which 278 are provided with baths.

Canadian Railway Officials at Atlantic City Conventions.

Among the Canadian railway officials, etc., in attendance were the following:—

CANADIAN PACIFIC RY.—H. H. Vaughan, Assistant to Vice President; R. W. Burnett, General Master Car Builder; H. Osborne, Assistant Mechanical Superintendent; W. E. Woodhouse, Superintendent of Motive Power; L. C. Ord, Assistant Master Car Builder; G. I. Evans, A. Dixon, Superintendents of Locomotive Shops; W. H. Winterrowd, Mechanical Engineer; H. C. Griffin, General Car Inspector; J. Burns, J. H. Mills, H. G. Reid, Master Mechanics; E. Eley, E. M. Wood, Divisional Car Foremen; R. V. Carleton, General Car Foreman.

GRAND TRUNK RY.—W. D. Robb, Superintendent of Motive Power; J. Coleman, Superintendent of Car Department; J. Markey, R. Patterson, Master Mechanics; A. Copony, J. Hendry, T. A. Treleaven, Master Car Builders; J. Powell, Chief Draughtsman, Motive Power Department; K. F. Nystrom, Chief Draughtsman, Car Department.

A. L. Graburn, Mechanical Engineer, Canadian Northern Ry.; T. A. Summerskill, Superintendent of Motive Power, Central Vermont Ry.; W. Gillespie, Master Car Builder, Central Vermont Ry.; J. L. Hodgson, Master Car Builder, Grand Trunk Pacific Ry.; W. T. Kuhn, Superintendent of Motive Power, Toronto, Hamilton and Buffalo Ry.; W. H. Flynn, Superintendent of Motive Power, Michigan Central Rd.; E. R. Webb, Master Mechanic, Michigan Central Rd.; H. J. White, General Car Foreman, Canadian Northern Quebec Ry.; J. V. Ware, Chief Clerk to Master Mechanic, Canadian Northern Ontario Ry.; J. Ogilvie, Mechanical Expert, Board of Railway Commissioners; A. W. Wheatley, General Manager, and W. Casey and G. Cavin, Canadian Locomotive Co.

Atlantic City Convention Notes.

Jas. Powell, Secretary Canadian Railway Club, Montreal, was among the visitors.

F. W. Morse, formerly of the G. T. R. and G.T.P.R., was among the convention guests.

A. W. Horsey, formerly of the C. P. R. mechanical staff, went over Atlantic City in a hydroplane.

T. McHattie, Master Mechanic G. T. R., Montreal, was unable to attend the A. R. M. A. Convention. He and Mrs. McHattie expect to visit Nova Scotia in July.

Jas. Ogilvie, Assistant Chief Operating Officer, Board of Railway Commissioners, Ottawa, had to leave for home in the middle of the convention, having contracted a severe cold.

A. W. Wheatley, Vice President and General Manager; W. Casey, Efficiency Engineer, and G. Cavin, Assistant Mechanical Engineer, Canadian Locomotive Co., Kingston, Ont., were among the visitors.

G. I. Evans, Superintendent Locomotive Shops, C. P. R., Montreal, was at Atlantic City for the M. C. B. Convention, but was unable to remain for the A. R. M. M. He was accompanied by Mrs. Evans, and her sister, Miss Peel.

R. W. Burnett, General Master Car Builder, C. P. R., acted on the committee on obituaries of deceased members, with special reference to the late G. H. Eaton, formerly Assistant Master Car Builder, Western Lines, C. P. R., Winnipeg.

The registrations of attendance during the conventions was as follows:—Members M. C. B. and A. R. M. M., 631; special guests,

451; ladies, railway, 352; ladies, supply, 272; supply men, 1,403; total, 3,109. The total registrations in the three previous years were, 1913, 3,352; 1912, 2,887; 1911, 4,251.

H. H. VAUGHAN, Assistant to the Vice President, C.P.R., Montreal, while attending the recent conventions, participated in the golf tournament. He was one of eight who tied for the two blind score prizes, two handsome silver cups, and when the winners were decided by lot, he secured the first prize.

Mrs. A. Fenton Walker, Business Representative, Canadian Railway and Marine World, with headquarters in New York, N. Y., was a member of the American Railway Supply Manufacturers' Association's entertainment committee, which had charge of all matters relating to entertainment in connec-

tion with the two conventions. She was also a member of the sub committee for the M. C. B. dance on the pier, at which over 700 were present.

In the track exhibit the C.P.R. had an 80,000 lbs. capacity steel frame box car, of its latest design. It weighs 36,000 lbs., and has a structural steel frame with channel centre sills, Z bar framing and horizontal wooden sheathing. The principal feature of difference from the large number of this type on the C.P.R., there being nearly 30,000 in service, is in the new Burnett steel roof, which has been applied to this car. It is of arch shape, without carlines, purlines or ridge pole, the steel sheeting being interlocked at the edges, with cap sections over these interlocked edges on the outside.

Railway Supply Exhibits at the Atlantic City Convention.

As usual there was a very comprehensive display of railway appliances, etc., on the pier, the space occupied by exhibits being 82,000 sq. ft. against 88,222 in 1913 and 83,507 in 1912. Among the principal exhibitors were the following:—

American Brake Shoe & Foundry Co., Mahwah, N. J.—Brake shoes; locomotive driver brake shoes and brake heads; flanged and unflanged passenger coach shoes; unflanged freight car shoes.

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

Anchor Packing Co., Philadelphia, Pa.—Air pump and throttle packing; air pump gaskets.

Bird-Archer Company, New York, N. Y.—Samples of Polarized; also samples of tubes from locomotives that have been treated by same.

Boker & Co., Hermann, New York, N. Y.—Nickel clad sheets for car trimmings.—Novo and Novo superior high speed steels; special alloy steels.

Bowser & Company, Inc., S. F., Fort Wayne, Ind.—Gasolene and oil storage systems, consisting of long distance and first floor self-measuring pump and storage tanks. Red sentry enclosed long distance pumps with electric lamp attachment. Complete oil filtration system. Self-registering pipe line measure.

Buffalo Brake Beam Co., New York, N. Y.—Buffalo freight brake beams for all classes and capacities of equipment, including the new proposed M. C. B. beam, also beams for E. & L. equipment. Beams for all classes and capacities of tenders and electrical equipment, for standard, broad and narrow gauge. Buffalo passenger brake beams for all classes of service, including P. C. and L. N. equipment with automatically adjustable heads and safety locks.

Carborundum Company, Niagara Falls, N. Y.—Carborundum and aloxite.

Chicago Car Heating Co., Chicago, Ill.—Vapor system of car heating; car heating specialties; hot water heating specialties.

Chicago Railway Equipment Co., Chicago, Ill.—Brake beams of the PC Creco, EL Creco, Diamond special, Diamond, Drexel, Ninety-Six, Monarch and special types; Creco inverted and economy roller side bearings; brake slack adjuster; automatically adjustable brake head; semi-adjustable brake head; removable leg brake head; Creco sliding third point support and safety device; reversible and duplex brake beam struts.

Clark Foundry Company, Rumford, Maine. Combined punch and shear. Represented by Philo B. Clark and Leslie D. Jannell. Space 137.

Coe Manufacturing Company, W. H., Providence, R. I.—Coe's ribbon gold leaf;

ribbon aluminum leaf; Coe's gilding wheels.

Commercial Acetylene Railway Light & Signal Co., Inc., New York, N. Y.—Car lighting—acetylene mantle and open flame lamps; Headlight—acetylene headlights, classification and cab lamps; Signals—acetylene lighted signals with the "AGA" flashlight feature; Marine lighting—Buoy valve; Welding—Oxy-acetylene welding equipment.

Consolidated Car Heating Co., Albany, N. Y.—Latest types two-piece steam couplers; sectioned quick opening end valves; packless end valves; sectioned quick opening admission valves; packless admission valves; single and twin pressure traps; single and twin vapor traps; automatic drain valves; syphon bellows specialties; special steam fittings.

Consolidated Railway Electric Lighting & Equipment Co., New York, N. Y.—The "Axle light" equipment under operating conditions, in connection with lead or Edison batteries; new ampere hour battery charge control; type "L" regulators; Timken and ball bearings. The "Clothel" rotary air compressor.

Dearborn Chemical Co., Chicago, Ill.—Dearborn water treatment for use in locomotive and stationary boilers for the prevention of foaming, corrosion, pitting and scale formation. Waters analyzed and treatment prepared to suit the conditions found.

Detroit Lubricator Co., Detroit, Mich.—Number 22 series of bullseye locomotive lubricators; air cylinder lubricator; emergency valves; air brake lubricator; boiler valves; electrically operated flange lubricator exhibit complete; improved standard lubricator; "500" air compressor lubricator; sectional force feed oiler with cut-away tank packless and multiport valves; transfer filler.

Edison Storage Battery Co., Orange, N. J.—Edison storage batteries for train lighting, railway signals, baggage, freight and mail trucks, multiple unit control, electric incandescent headlights, inspection lamps, etc.

Flannery Bolt Co., Pittsburg, Pa.—Tate flexible staybolts; installation tools for applying Tate bolts; radial and adjustable crown flexible staybolts; "F. B. C." nut locks for freight cars.

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

General Electric Co., Schenectady, N. Y.—Reception room in which was installed an automatic machine showing lantern slides of machines and installations of interest to delegates attending the convention.

Gold Car Heating & Lighting Co., New York, N. Y.—Car heating systems; combination pressure and vapor; straight steam; hot water, refrigerator storage; electric

heaters; thermostatic control for steam, hot water and electric systems. Pressure regulator; temperature regulators; twin supply valves; steam hose couplers; ventilators; curtain window ventilators; journal boxes, and lids; dust guards.

Goldschmidt Thermit Co., New York, N. Y.—Samples of the Thermit welds including a large weld on a 9/4 in. 2 throw crank shaft for refrigerating machine. Materials and apparatus used in locomotive shops for Thermit welding; such as preheaters, crucibles, mold box, special mixtures of Thermit, etc. Samples of metals free from carbon and numerous photographs and transparencies of Thermit welding operations.

Greene, Tweed & Co., New York, N. Y.—Palmetto, round and square, braided packing; Palmetto twist packing for small valves; packing in sets for air pumps and throttles. Manhattan packing for hydraulic pressures; Favorite reversible ratchet wrench.

Grip Nut Co., Chicago, Ill.—Grip nuts.

Hunt Spiller Manufacturing Corporation, South Boston, Mass.—Cylinder bushings; cylinder packing; piston heads; valve bushings; valve packing; valve bull rings, cross-head shoes; shoes and wedges; driving boxes; rod bushings; knuckle pin bushings; crown bearings; air pump bushings; air pump packing; eccentrics and straps.

Independent Pneumatic Tool Co., Chicago, Ill.—Thor piston air drills for drilling, reaming, tapping, flue-rolling and wood boring; corner drills for use in close quarters; pneumatic riveting, chipping, calking and flue-beading hammers; pneumatic staybolt drivers; Thor pneumatic grinders; Thor electric drills.

Ingersoll-Rand Co., New York, N. Y.—Pneumatic tools, consisting of "Little David" roller and ball bearing piston air drills, for drilling, reaming, tapping and flue rolling; riveting hammers for driving rivets up to 1 1/4 in.; chipping hammers for all classes of chipping, calking, scaling, flue beading; Imperial air motor hoists—capacity up to 10 tons; Little David jam riveters; Crown holder-ons and Crown bench and floor sand rammers.

Johns-Manville Co., H. W., New York, N. Y.—Asbestos and magnesia material; asbestos cements; pipe coverings; boiler lagging; packings, roofings, waterproofing; mastic flooring; J.-M. expander rings; transite and ebony asbestos wood; asbestos shingles; transite asbestos smoke jackets; steel passenger car insulation; refrigerator car insulation; fibre and sectional conduit; electrical materials; J.-M. automatic car seal; flexible armoured hose; Jones speedometers for locomotives and passenger cars; cork tilings; linolite lighting.

Kerite Insulated Wires & Cables Co., New York, N. Y.—Kerite insulated wires and cables.

Locomotive Superheater Co., New York, N. Y.—Electric pyrometer for indicating the temperatures of superheated system; latest design of superheater unit; soft metal grinding process mould.

McCord & Co., Chicago, Ill.—Steel and malleable iron journal boxes; force feed locomotive lubricators.

Norton, Inc., A. O., Boston, Mass.—Lifting jacks.

Pyle-National Electric Headlight Company, Chicago, Ill.—Locomotive electric headlight set and headlight case; type "E" turbo-generating set (arc headlight set); type "S" turbo-generating incandescent headlight set.

Railway Materials Company, The, Chicago, Ill.—Steel back brake shoe; Ferguson shop furnaces; blue prints.

Railway Utility Co., Chicago, Ill.—Utility honeycomb car ventilators for monitor deck

and for arch roof cars; thermometer steam heat regulator; thermometer electric heat regulator; automatic freight car door locks; electric vacuum car cleaners.

Safety Car Heating & Lighting Co., New York, N. Y.—Pintsch mantle lighting equipment; Safety electric car lighting equipment; gas and electric lighting fixtures; oxy-Pintsch metal cutting and welding apparatus; electric fans.

Standard Coupler Co., New York, N. Y.—Sessions-Standard friction draft gear type "K."

U. S. Light & Heating Co., Niagara Falls, N. Y.—The U. S. L. electric lighting equipment for railway cars in operation; electric regulating panels; electric generators; storage batteries of all types; electric starter for gasoline engines.

Westinghouse Air Brake Co., Pittsburgh, Pa.—No apparatus was placed on exhibition this year, having instead the usual space for reception purposes, with representatives on hand for rendering whatever advice or information might be desired in connection with the subject of air brakes.

Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa.—Reception booth with the Westinghouse companies and arc welding exhibit in operation on the pier end.

Birthdays of Transportation Men in July.

Many happy returns of the day to:—

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

M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.

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

H. F. Bradley, Passenger Manager, Allan Line Steamship Co., Montreal, born at Waterville, Que., July 20, 1876.

D'Alton C. Coleman, General Superintendent, Alberta Division C.P.R., Calgary, born at Carleton Place, Ont., July 9, 1879.

Geo. Collins, General Manager, Central Ontario Ry., Trenton, Ont., born at Kingston, Ont., July 20, 1860.

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

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

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

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

S. E. Dewey, Commercial Agent, All Rail Line, G.T.R., New York, born at Beckenham, Kent, Eng., July 4, 1879.

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

J. B. Gray, ex Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, now lessee of lunch rooms, Angus Shops, C.P.R., Montreal, born July, 1876.

J. H. Hanna, ex-Division Freight Agent, G.T.R., at Hamilton, Ont., now at Calgary, Alta., born at London, Ont., July 27, 1867.

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

C. A. Jaques, ex steamship owner, Montreal, born there July 15, 1849.

C. W. Johnston, Assistant to Passenger

Traffic Manager, G.T.R., Montreal, born at Actonvale, Que., July 27, 1879.

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

R. G. McNeillie, Assistant General Passenger Agent, Western Lines, C.P.R., Winnipeg, Man., born at Lindsay, Ont., July 1, 1883.

J. M. Macrae, District Freight Agent, Canadian Northern Ry., Saskatoon, Sask., born at Stornoway, Scotland, July 31, 1884.

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

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

J. E. Morazain, Assistant Superintendent, Montreal Terminals, C.P.R., Montreal, born at Wheatland, Que., July 31, 1875.

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

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

J. E. Quick, General Baggage Agent, G.T.R. and G.T.P.R., Toronto, born at Richmond, Ontario Co., N. Y., July 10, 1851.

G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.

P. E. Ryan, Secretary, National Transcontinental Railway Commission, Ottawa, born there July 26, 1876.

Geo. Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1870.

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

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

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

An Unchartered Railway.—In an action for damages for personal injuries decided in the Supreme Court of British Columbia, at Victoria, May 25, the Canadian Collieries (Dunsmuir) Limited, being defendants, C. F. Compton, Assistant Secretary, stated that the company was not a railway company but a coal company; its trains carried coal from the mines, and also did some passenger carrying. In reply to the judge, Mr. Compton said the original railway was never incorporated, as it was built by a private individual, on his own land. The Wellington Collieries had no railway charter either. In cross examination, Mr. Compton said the line crossed government highways in three or four places. Reports as to the company's operations were made to the Dominion and Provincial Governments, in which it was explained that the railway was operated without a charter; the railway carried passengers, and tickets with the name of Wellington Colliery on this were issued. It was subsequently brought out by another witness, that the Wellington Colliery Ry. was incorporated in 1911, but that it did not own the line on which the accident happened, although that line was a branch of it.

T.H. & B. Hamilton Entrance.—An Ottawa dispatch of June 19 says:—"The Supreme Court decided to-day in a stated case that the Board of Railway Commissioners has not the right to order the Toronto, Hamilton and Buffalo Ry. to locate a new line in the city of Hamilton by way of compelling the use of a common entrance. The Commission ordered the railway to make the change, but its jurisdiction was attacked by the railway, whose contention is upheld."

Trainshed at Windsor St. Station, Montreal, Canadian Pacific Railway.

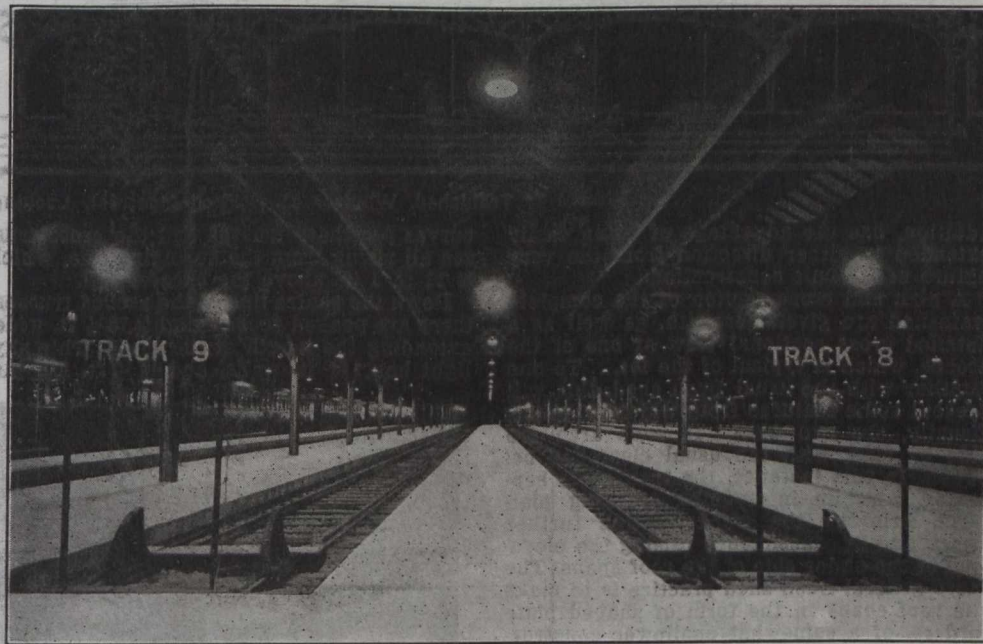
The new Windsor St. station in Montreal, which the C. P. R. has had in course of construction for the past four years, is now practically completed. Several progress articles on the work have appeared in these columns from time to time, and a description of the terminal yards in connection with the station was published in our Nov., 1913, issue, followed in the December issue by an article on the power interlocking and signaling arrangements, both of which treated the trainshed area in a general way.

In the remodelling of the station, a difficult problem was presented. The original station on this site was built for the Ontario and Quebec Ry., before its absorption by the C. P. R., about the time the latter completed its transcontinental line. The first station was built along Osborne and Windsor Streets, on the very brow of a comparatively steep hill. The station being small, to meet the then existing traffic, had ample accommodation on the narrow strip between the street and the hill descent, but as the traffic increased, the problem was presented of extending the station in the only possible direction, viz., to the south, on fills made on the side of the slope. Extensions up to the last one, were not very difficult, as the fill required was not very great, but this last addition, extending the trainshed capacity to 11 tracks, required heavy fill work along the downhill side. Under a portion of this extension, there have been built vault and third class waiting room accommodation, but the major portion is on a fill, retained by a concrete embankment wall.

The track arrangement in the station is unusual, all the tracks being entered from a ladder from the west, the ladder leaving the northerly of the tracks, branching off to each of the other tracks, so that the tracks diminish in length from the north to

arrangement of trainshed ends. The northerly, or express track, has single arch, supported on the express building wall, and rows of columns between it and the adjoining tracks, which is only 450 ft. long, the greater portion of the track being open. The next

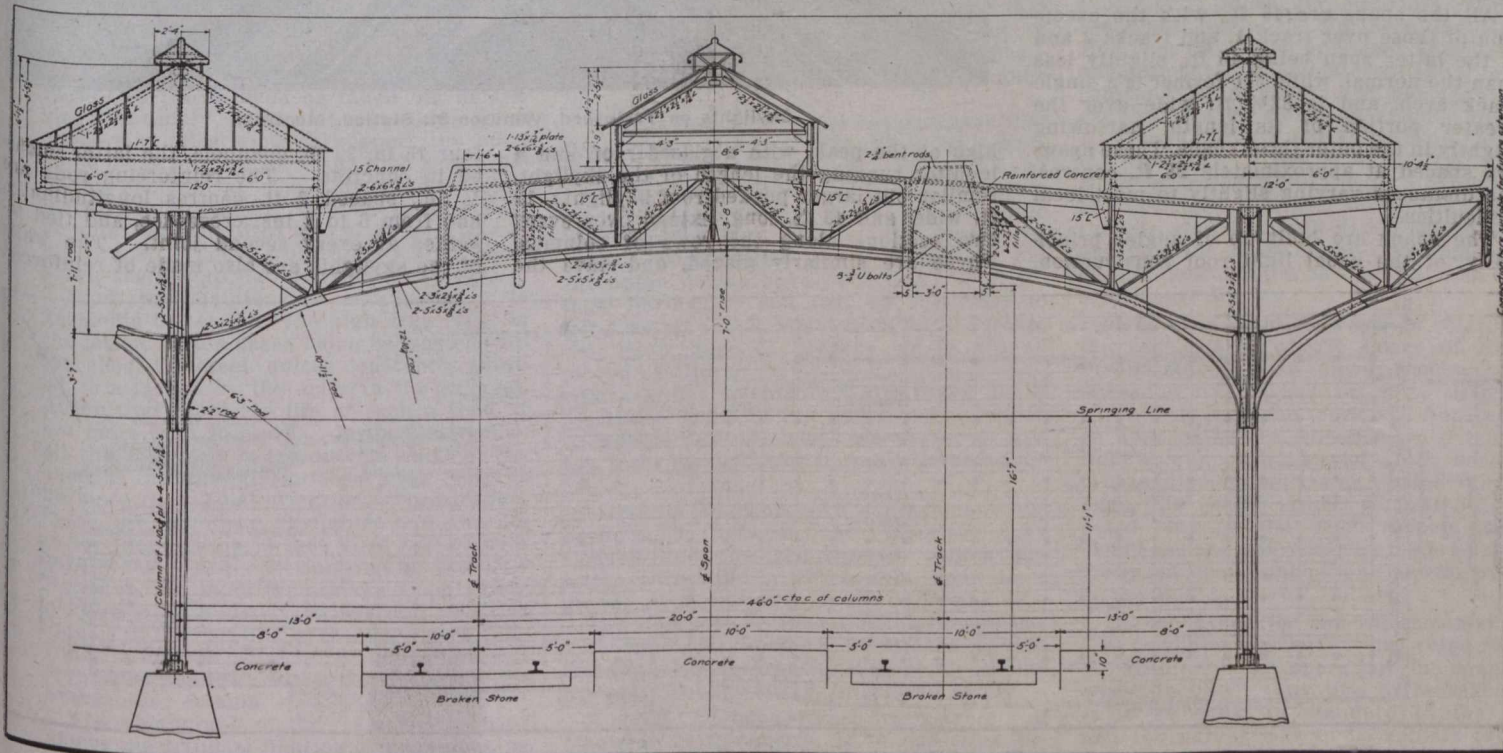
different in the details of design, as a comparison of existing design with the one under consideration will show. An interesting instance of the usual design is that of the G. T. R. central station at Ottawa, which was described in Canadian Railway



Interior of Trainshed, Windsor Street Station, Montreal, Looking from Station End.

four tracks, 2 to 5 inclusive, have trainshed roofs extending 1,003 ft., with the next two, 6 and 7, 807 ft. long, and the next two pairs, 8 and 9, and 10 and 11, cut off at 534 and 450 ft. respectively. This, including canti-

and Marine World for Nov., 1911. In contradistinction to the former practice of either having a high arched or plain span roof, high above the tracks, to be clear of the injurious effects of the locomotive fumes, or



Cross Section of One of the Arches of Trainshed, Windsor St. Station, Montreal.

the south, the track capacity varying for train lengths from 5 to 14 cars, the northerly track having a length in the clear of 1,400 ft. The tracks cutting off in this manner from the ladder, have made necessary a staggered

lever umbrellas over outside platforms, gives a total covered trainshed area of 5 acres, or a train capacity, making due allowance for locomotive length, of about 120 cars.

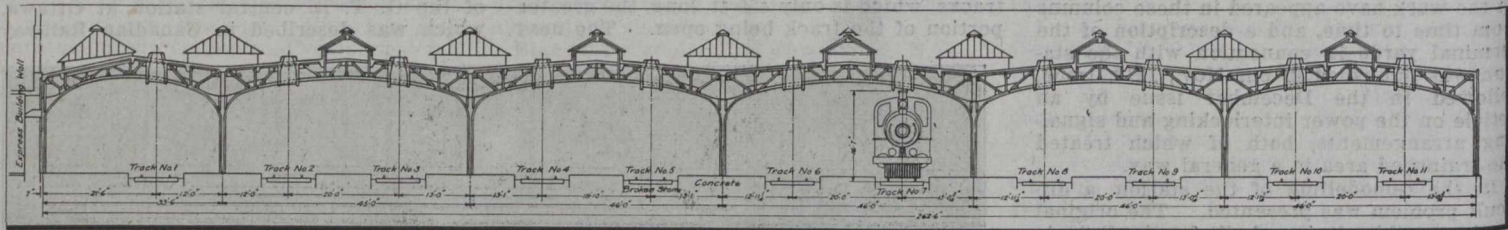
The usual Bush trainshed is somewhat

else the umbrella type of overhanging platforms, which are more or less common in stations of small size, the Bush trainshed is a series of short span arches, usually made to span two tracks, and supported on rows of columns, of low construction, a duct

in the roof directly over the smoke stack taking care of the locomotive exhaust, the blast passing directly to the outside through this duct. This low roof, short span construction is said to make possible the elimination of half the weight of steel usually involved in a large balloon roofed shed, and in

central portion of which is practically parallel with the upper member of the truss. Between columns, the structure is tied together with a four pannelled truss of similar design, 4 ft. deep, composed of parallel top and bottom members except at the columns, where the lower member is a two centre curve, the

free from the injurious effect of the locomotive exhaust fumes, which in the usual high arch roof have such a disastrous effect on the life of the shed. Where the duct crosses the arch trusses, the latter is also encased in reinforced concrete, which is tied in place by 8 embedded $\frac{3}{4}$ in. U bolts, the



Cross Section of Trainedshed, Windsor St. Station Montreal, Looking towards the Station.

addition, has the advantage of being easily extended in either direction from the very nature of its unit construction.

A plan and cross section of the complete trainedshed are given herewith, as well as a detailed cross sectional view of one of the arches, which is typical of the lot. To one familiar with the usual Bush shed, this will present some features from which it differs. Usually, the two tracks in each arch are side by side, with the usual clearance between. In this instance, the tracks are separated with an intervening trucking platform, bringing the track centres further apart, and in consequence raising the elevation of the under side of the roof spans. The more general Bush shed practice is to make the roof spans in the form of shaped plate girders, of a somewhat shallower construction than in this instance, which, added to the lesser height due to the tracks being closer together, makes the usual design seem lower set. These two features of the Windsor St. shed design give a more open effect, the roof being considerably higher. In this case, the roof spans are made up of formed lattice girders.

All the spans are 46 ft., with the exception of those over track 1, and tracks 2 and 3, the latter span being 45 ft., slightly less than the normal, while the former is a single track arch, and is 33 1/2 ft. wide over the greater portion of its length, narrowing slightly in the outer three spans. These spans are spaced at approximately 28 ft. centres, the distances varying slightly to meet local difficulties.

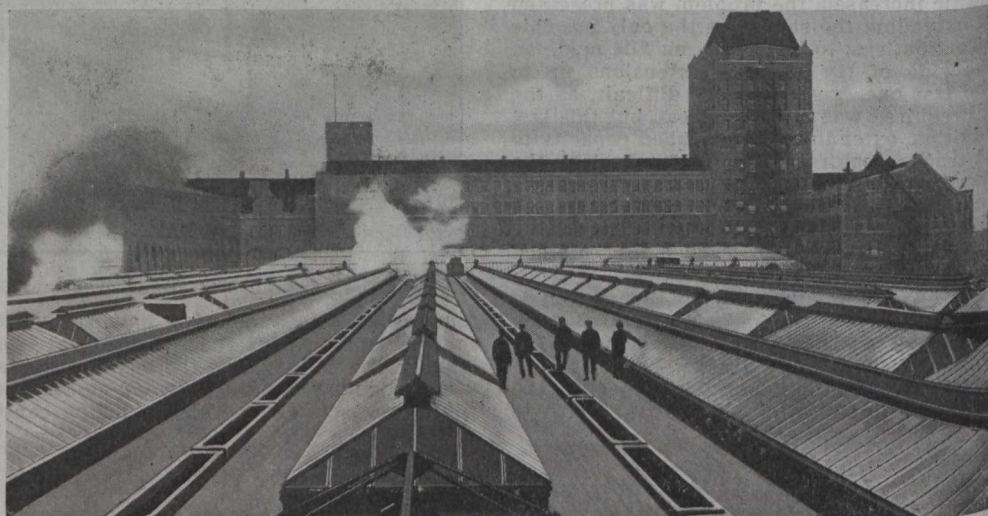
The spans are built up of angles principally, of the usual light roof construction,

curves for these trusses and the cross trusses all rising from the springing line, which is 11 ft. 1 in. above the base of rail.

Down the centre line of the arched trusses, there are peaked roof skylights, 8 1/2 ft. wide, extending the length of the shed. This skylight has 1 3/4 ft. walls, and is 4 ft. 2 1/2 ins.

lower edge of this joint being higher than that of the duct sides, and rounded, so that the gases will not escape under the edges of the latter into the shed.

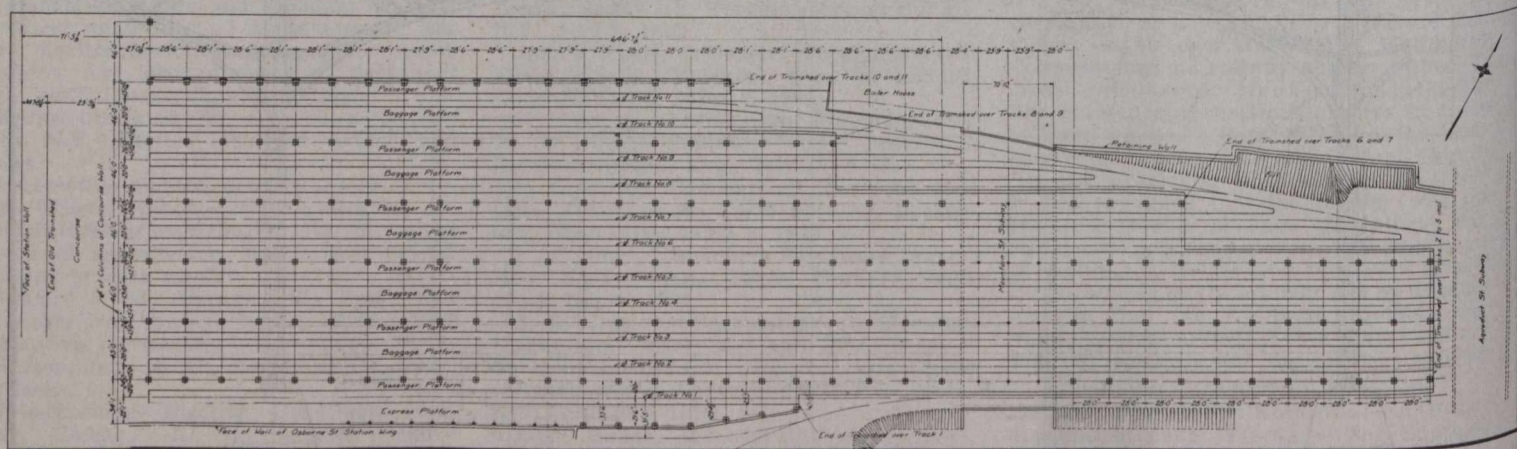
The roof proper is of reinforced concrete, 3 ins. thick. This is carried on the longitudinal column trusses, the duct trusses, and



Skylights on Trainedshed, Windsor St. Station, Montreal.

high at the peak, with a glazed roof, and a monitor running the length of the skylight. Similar but larger peaked roof skylights, 12 ft. wide, and 48 ft. long, extend over every two sections along the rows of columns. These are similarly glazed, and have the

four 15 in. 33 lb. channels, the latter encased in concrete. The reinforcing rods are 1/4 in., spaced 2 ft. centres longitudinally, and from 6 to 8 ins. crosswise, and tied together at every second joint. The walls of the skylights are also made of reinforced



Plan of Trainedshed, Windsor Street Station, Montreal.

the girder having a depth of 3 ft. 8 ins. at the centre, increasing to 5 ft. 2 ins. over the columns. The upper edge of the truss is straight, sloping from a central height above base of rail of 21 3/4 ft., to a 19 ft. 10 ins. over the columns. The inner edge of the truss is a seven centred curve, the

same monitor peak elevation as the central skylights.

The smoke duct framings are lattice girders, made up of angles, and are 3 1/4 ft. deep, one each side of the track centre line. They are completely encased in reinforced concrete, which keeps all the steel work

concrete. The design of the roof is quite different from the usual Bush type. In the latter, the roof is flatter, with the skylights approximately parallel with the roof surface, and raised about 12 ins. above that surface. In this design the walls of the upper por-

tion of the smoke duct taper inwards to a width of 18 ins., similar to the Canadian Northern Ry's Winnipeg shed, and Central Rd. of New Jersey shed at Jersey City. This arrangement has several advantages. With the flat skylight, heavy snowfalls are more liable to cover the whole roof surface, the skylight becoming covered with snow so as to render the interior lighting poor. With the raised skylights, it is believed that the snow in drifting over the roof will deposit itself in the spaces between the skylights, leaving the latter clear, and free of snow. With the straight side smoke duct, the snow when drifting badly, has a greater tendency to drift down through into the shed interior. By reducing the upper opening of the slot by one-half, this tendency is reduced by the same amount. The snow holding capacity of this roof is considerably greater than with the usual design, but where it is deemed advisable, the surplus snow may be shovelled down from the roof through the slot, into flat cars on the tracks below.

The platform arrangement differs from the usual design, as already mentioned. The tracks under each arch are spaced at 20 ft. centres, with an intervening 10 ft. platform. This latter is used for baggage and express traffic, leaving clear the 16 ft. platform on the other side along the row of columns, this clear for passenger traffic exclusively. This has already been found to be a great advantage in handling the traffic expeditiously, and while this arrangement requires a slightly wider span to allow for this extra platform, it is considered worth while. The platforms are of concrete, while the roadbed is of broken stone. In the building of the shed, it was found necessary to slightly lower the latter temporarily to allow for the smoke duct concrete moulds, thereby allowing the work to be carried forward after the erection of the steel work, without interruption to traffic.

A very important advantage in this type of shed is the manner in which it can be erected without interrupting the traffic seriously. From the very nature of its unit construction, it is possible to put up the shed over two tracks at a time, so that only these two tracks need be taken out of service at a time. Instead of requiring a great amount of false work to support the steel while being erected, as in the high arch type, in this scheme the whole span can be completed at the works, shipped to the shed on a flat car, and lifted into place by a wrecking crane. Thus, from an erection viewpoint, the design has marked advantages.

From the maintenance standpoint, it is decidedly better than the high arch type. In the latter, all the gases being exhausted into the shed, the steel, unless constantly painted, is attacked by the acids in the exhaust. Authorities place the life of such a shed at not more than 20 years. In the Bush shed, all the gases are taken outside clear of the shed, so that the interior steel work requires no more than usual attention. In addition, there are no dirty skylights, and the interior illumination is thus kept better, with less work. The accessibility of the skylights in the Bush type, make them easily cleaned when necessity arises, and this also applies to the painting of the steel work. The roof drainage is cared for by copper gutters from the shallow ridges of the roof, at every other column.

The photograph of the trainshed interior shows the artificial lighting arrangement, as supplied by the Northern Electric and Mfg. Co. Centrally in each section of the station, over each platform, there is a 60 watt tungsten lamp, at a height of 15 ft. from the platform to the base of the shade, and suspended 5½ ft. below the supporting beam. All the wiring is run in conduit, and the lighting is controlled from an 80 circuit

panel, located in the station master's office.

The design of these trainsheds was developed under the supervision of P. B. Mot-

ley, M. Can. Soc. C. E., Bridge Engineer, C. P. R., to whom we are indebted for the data on which this article is based.

Canadian Pacific Railway Construction, Betterments, Etc.

Atlantic Division.—Local press reports state that some negotiations have taken place between the C.P.R. and the Dominion Government, with a view to the purchase of the Windsor branch of the Intercolonial Ry., which extends from Windsor Jct. to Windsor, N.S., 32 miles, and is operated by the Dominion Atlantic Ry., on an agreement under which the Government maintains the line, for a fixed proportion of the receipts.

It was announced after an official inspection of the lines in the vicinity of Fredericton N.B., recently, that \$75,000 would be expended on the betterment of the roadbed of the Gibson branch during the year. It is said to be intended to bring the branch up to the standard of the recently completed Fredericton and Grand Lake Ry. and Coal Co.'s line.

Eastern Division.—The Board of Railway Commissioners has authorized the opening for traffic on the second track from Iberville to St. Johns, Que., mileage 19.2 to 20.02.

Application is being made to the Board of Railway Commissioners for permission to build a branch in Longue Pointe from the main line west of Moreau St., Hochelaga Ward, Montreal, easterly and northerly through Maisonneuve, and Longue Pointe to Cadastral Lot 396, with a spur in connection therewith. The route of this projected line has been before the courts, in so far as it is located through Maisonneuve, and the matter is likely to go to appeal. The application, mentioned above is for the purpose of setting certain points in order, as required by one of the judgments.

Ontario Division.—It was understood that a regular train service would be put in operation on the newly completed Campbellford, Lake Ontario and Western Ry. June 29.

A Brampton, Ont., press report states that the citizens propose to build a line from there to a connection with the C.P.R. at Islington, and that the C.P.R. will operate a suburban train service over it from Toronto to Brampton, for 60% of the traffic receipts. Confirmation of this is lacking, but Brampton people have been doing their utmost during the last four or five years to get a better C.P.R. connection with Toronto than they have at present, or to get an electric railway.

The bridge over the Nottawasaga River at Baxter, Ont., on the Sudbury line, which collapsed May 15, has been restored, and the train service over it was resumed June 16.

Manitoba Division.—An arrangement has been made between the Winnipeg City Council and the company by which the latter will build a three mile spur to a gravel pit at Springfield, owned by the city.

The Board of Railway Commissioners has authorized the opening for traffic of the Snowflake west branch, just north of the International boundary, mileage 0 to 10.

Alberta Division.—The ratepayers of Medicine Hat, Alberta, have passed a by-law appropriating \$70,000 as its proportion of the cost of a subway under the C.P.R. tracks in the centre of the city.

George Bury, Vice President, visited Lethbridge, June 7, on a trip of inspection over the Weyburn-Lethbridge line. He is reported to have said that the line will be completed in 1915. Track is reported to

have been laid 60 miles westerly of Shaunavon, at which point divisional terminals are being built. The contract for the buildings is reported to have been let to C. W. Sharp & Son, Winnipeg, at an estimated cost of \$50,000.

A contract is also reported to have been let to C. W. Sharp & Son, for the erection of terminal buildings at Empress, on the Swift Current-Bassano extension, at an estimated cost of \$50,000.

Track laying is being proceeded with north west of Retlaw, towards the ore country. Local press reports state that a C.P.R. engineering party is in the field locating a line right through to the oil fields.

British Columbia Division.—The tunnel located at mileage 40.4 Boundary Subdivision is on a division of the line now under construction. The diversion will cross a gully at a point where it is possible to replace a wooden trestle by a fill. The tunnel is located on a 2% gradient on a tangent. It will be built according to C.P.R. standards. H. Rindal, Division Engineer, Vancouver, B.C.

The big bridge being built over the Harrison River at Chilliwack, B.C., has a total length of 950 ft. The superstructure is nearly completed, and it is expected it will be ready for traffic by July 31. The bridge over the Pitt River, at Coquitlam, 1,750 ft. long, is expected to be completed in Nov. Both these bridges are to carry double tracks. (June, pg. 261.)

Northern Consolidated Holdings Co.—Application was filed in the Ontario Courts, recently by G. Alexander, Montreal, asking for the winding up of the Northern Consolidated Holdings Co. The applicant asked for the appointment of a liquidator, alleging that the company is insolvent, and demands a full enquiry into its condition and its accounts. He claims to represent \$1,000,000 of stock in the company. The N. C. H. Co. was incorporated Dec. 8, 1913, with a capital stock of \$8,000,000, of which Mackenzie, Mann & Co., are stated to hold \$4,000,000, to acquire and hold the stock of the companies acquired and consolidated as the Canadian Northern Quebec Ry.

Fires near Right of Way.—In reference to the requirement of the Board of Railway Commissioners that railway companies submit monthly reports on fires originating within 300 ft. of the track and burning over an area of 100 sq. ft. or more outside the right of way, particulars of which were given in Canadian Railway and Marine World for June, the Board issued general order 126, dated May 28, that such reports shall be privileged and shall only be made public and given out upon application therefor by order of the Board.

Branch Lines for the Intercolonial Ry.—The Dominion Parliament has voted \$500,000 to acquire lines operating in connection with the I.R.C. Any line to be taken over is to be equal in standard to the I.R.C., and the purchase is to be subject to notification by Parliament. It is said that the line which it is desired to deal with at once is the New Brunswick and Prince Edward Island Ry., running from Sackville to Cape Tormentine, N.B., which would give the direct connection between the mainland terminal of the Prince Edward Island car ferry and the I.R.C.

Timiskaming and Northern Ontario Railway Steel Passenger Equipment.

The T. and N.O.R. Commission some months ago ordered 13 passenger cars from the Pullman Co., of all steel construction, sufficient to equip two through passenger trains. The order includes five different types of cars: 3 first class passenger cars, 2 second class passenger cars and 2 combination smoking and second class passenger cars, all 71 ft. long over the end sills; and 3 baggage and mail cars with 30 ft. mail section, and 2 baggage and express cars, both these types 60 ft. long over end sills. All the passenger cars will have seating capacity for 80.

The cars will be lighted by electricity, power being supplied from an axle generator, and will, in addition, be equipped with a generous storage battery system for supplying light when the cars are not in motion. The heating will be by a combination vapor and pressure system of steam heat, automatically controlled to maintain the degree of heat desired, none of the cars having a stove, except the mail cars, each of which will have a small emergency stove. In addition to an efficient arrangement of ventilators, the passenger cars will be equipped with two electric fans each, one fan on each end of the car. The passenger car lavatories and washstands will be supplied with the latest type air pressure water supply.

All the cars will have fish belly centre sills in the underframes, with combined cast steel bolsters and platforms. The superstructure will also be entirely of steel, having an exterior finish of steel plates, well insulated from the interior ceiling of fireproof material. Six-wheel trucks will be used, the frames of which are to be cast steel.

The passenger cars will have embodied a new feature in steel car design in the shape of an anti-telescoping device, which, it is claimed, will substantially reinforce the end framing and vestibules, and greatly reduce, if not wholly eliminate, the liability of the cars telescoping in case of wreck. This device consists of two I beams of heavy section, bent into a U shape, with the arms upward, the corresponding arms of the two U's forming the door posts in bulkhead and vestibule. These sections are secured in the steel underframe end casting, and also at the top, so that in the event of a collision, it is claimed that the impact would do no more than cause the vertical arms at the outer end to collapse, and if the impact were sufficiently great, the inner arms might also be bent.

The maximum bending moment in the centre sills for the passenger cars is 4,655,671 in.-lbs.; for the baggage cars, 4,159,816 in.-lbs.; and for the baggage and mail cars, 3,592,180 in.-lbs. The centre sills possess an area of 43.62 sq. ins., and the side sills an area of 11.6 sq. ins., so that there is a total area to resist the direct buffing shocks of 55.22 sq. ins. The moment of inertia of the centre sills is 4,863, and the section modulus for the top flange is 474.93, and for the bottom flange, 301.3. The maximum stress due to the weight of the car and lading will occur in the passenger car, amounting to 15,460 sq. ins.

The baggage and mail, and baggage and express cars, are of similar construction, and of the same size. The underframing is of the fish belly type, consisting of two 5-16 in. centre plates, 37 ft. long, connecting to the steel bolster castings. The central 15 ft. of these centre plates is 2 ft.

2 ins. deep, tapering from that point to a depth of 17 ins., where they connect to the bolster casting. These plates are 18 ins. apart. To the top outer edge of each plate, there is rivetted a 5 by 3½ by ½ in. angle, and at the bottom of each plate outside and inside, 3 by 3 by ¾ in. angles. A ¾ in. cover plate, 2½ ft. wide, extends the same length as the centre plates.

The body bolster castings are at 42 ft. centres, and there are two crossbearers, 15 ft. apart, of cast steel, in line with which are separators, also of cast steel. The crossbearers and separators have a cover plate extending across the centre sill members. Over the top of the centre sill and crossbearers, is a 1-16 plate, covering the full area of the car, with pressed stiffeners extending from the centre sill outward at centres averaging about 2 ft. Attached to the outer end of the crossbearers on each side of the car, is a 5 in. 11.6 lb. Z bar, extending the length of the car, to the outwardly projecting flange of which is attached a 4 by 4 by 5-16 in. angle, of the same length, the outer flange of which projects upwards. This side sill construction assumes the form of a box under the two side doors of the car, the web of the Z having a 7¾ by ¼ in. plate, 10 ft. 11 ins. long, attached to its web, with a 3 by 3 by ¼ in. angle, 11 ft. 0½ in. long, rivetted along the top, and two 7 by ¼ in. plates, 6¼ ft. long, attached to the upturned flange of the side sill angle, the whole superimposed with a steel threshold casting.

The two door openings are each 5 ft. 9½ ins. wide, and 24 ft. 2¾ ins. apart from inner edge to inner edge. Extending the length of the car, except for the door openings, which are reinforced as mentioned, there is a side sill plate, 2 ft. 9¾ ins. deep, of 3-16 in. plate, reinforced along the top edge by a 4 by 1¾ by 7-16 in. angle. This plate, angles, and Z bar, and box construction under the door openings, form the side sill construction of the car.

The side posts are of flanged 3-16 in. plate, at about 2 ft. centres, and are diagonally braced at both ends, and at the both sides of the door openings. There are four window openings along each side, 2¼ ft. by 3 ft. 8 7-16 ins., between the side posts, which are slightly farther apart at these points. The side framing of the car is 7 ft. 5 13-16 ins. deep.

The side posts are attached to a 4 in. Z bar along the top edge, which, with a letter board, 11¾ by ½ in., reinforced along the bottom edge by a 2¾ by ½ in. stiffener, forms the top side framing girder.

The side roof, of 0.063 in. plate, is carried on 2 by 2 by 3-16 in. carlines, at 3 ft. centres, bent to a 3 ft. 5½ in. radius. A 2 by 2 by ¼ in. angle forms the lower edge of a deck panel, which is 15 ins. deep, of ½ in. plate. The upper edge, forming the deck chord, is of ½ in. plate, bent to an angle. Between these deck chords, arch the deck carlines, which are pressed from ½ in. plate to a radius of 18 ft. 1 in. The roofing is 0.078 in. plate.

The construction of the passenger cars is almost identical with that of the baggage and mail, and baggage and express cars. The length over bumpers is increased to 71 ft., which gives an increased length to the underframing in proportion. Instead of two crossbearers, there are three, one central, and the other two, each 12¾ ft., each side of centre. The central 25½ ft. is straight, the ends tapering to the bolster castings. The truck centres are 55 ft. Apart from this change in length, the whole of the car framing is the same, from centre sill through side sills right up to the decking. The side framing above the side sills construction differs, in that there are a

series of windows the length of the car, with main posts between at 6 ft. centres, between which are small posts. The main posts are 12¼ ins. wide, and the intermediate ones, 2½ ins. wide. Apart from these changes, the construction of the cars is identical with the baggage, express and mail cars described above.

The cars have all been delivered.

Dominion Government Railway to Hudson Bay.

In a recent interview, N. K. Boyd, one of the contractors, is reported to have said in Winnipeg that it is expected soon to have 3,000 men on the work, of which over 2,000 will be engaged on grading and the remainder on bridge work, tracklaying and ballasting. The plant on the work consists of 3 steam shovels at Pas, and 2 at mileage 110; 13 locomotives; 100 Hart convertible cars, and numerous box and flat cars, in addition to two passenger cars which are being operated as far as mileage 110. It is expected to have track laid to the Manitou rapids of Nelson River, and to have the grading completed from the Manitou Falls to within 110 miles of Port Nelson by the end of the year. A large bridge is to be built at Manitou Rapids, and the foundation work will be done this year.

The work of laying out the terminals at Pas and at Port Nelson is being proceeded with. Two tracks have been laid at Pas, one from the roundhouse at Eighth St., and another from the Canadian Northern Ry., connecting with the bridge across the Saskatchewan River. It is reported that eight tracks are to be laid in the yards at once, in such a manner that six additional tracks may be added as required. We are officially advised that while track laying in the yards has been started, the complete details of the layout have not been worked out, and that it is expected to lay between six and eight miles of track in the yards during the summer. The work in progress at Port Nelson is of a more preliminary character. (June, pg. 264.)

Small Claims Against Government Railways.—The Dominion Parliament has repealed sections 3 and 4 of the Government Railway Small Claims Act, 1910, and replaced them by sections which provide that process shall not be issued in any suit against the Crown, but against the General Manager of Government Railways, and shall be served on him, or any person only authorized by him to accept such service. The General Manager shall be entitled by such description to appear, plead and defend, subject to the same rules of practice and procedure as any private person. The General Manager shall be entitled to set up and prosecute any setoff or counterclaim. If judgment is given in his favor, he may proceed to execution. In no case shall the General Manager be personally liable in respect of any proceedings under the act. The words "General Manager of Government Railways" are substituted for "Government Railways Managing Board," in sections 5, 6 and 8 of the act. A new section declares the General Manager to be the successor of the Managing Board, and as such to be entitled to receive the benefit of any actions already decided, and to carry on any actions now standing in the name of the Managing Board.

That the electrically controlled brake will be the means of solving many of the braking problems that are now being encountered, was the opinion expressed by H. H. Vaughan, Assistant to Vice President, C. P. R., at the annual convention of the Air Brake Association recently.

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The Postmaster General's Attempt to Establish an Autocracy.

Canadian Railway and Marine World is not a political paper and has no partisan bias. Its founder, who still controls it, is a Conservative. In forty years of voting life he has never voted for anyone but a Conservative candidate, at either Dominion or Provincial elections. In years gone by, he took a somewhat active part in political affairs, but on establishing this paper decided to withdraw from participation in them, without, however, in any way changing his personal views, believing that Canadian Railway and Marine World would thereby occupy a stronger position among its readers, embracing men of both political parties throughout the entire Dominion. For this reason political questions have found no place in its columns, but circumstances have arisen which make it necessary to depart from that policy, in one instance at least, and to protest against recent action by the Postmaster General.

On other pages of this issue considerable space is devoted to a bill introduced at the Dominion Parliament's recent session, by the P.M.G., in which a most barefaced attempt was made to give the occupant of that position even more autocratic powers than he already possessed, and to take from a large section of the people rights which should be inalienable. The portion of the bill particularly dealt with elsewhere in this issue is that relating to compensation to be paid electric railways for carrying postmen, the P.M.G. having made an ineffectual attempt to secure the power to fix this arbitrarily, without the companies affected being given the right to secure arbitration or to appeal in any way. This provision was included in an "omnibus bill," entitled "An Act to Amend the Post Office Act," in which a number of other matters were dealt with, including newspaper postage rates, registration and insurance of letters, appointments and salaries of railway mail clerks, etc., etc.

We say deliberately, and without fear of successful contradiction, that a determined attempt was made to smuggle this bill through Parliament, without at least two of the interests affected, viz., newspaper publishers and electric railway companies, being aware of its contents. It was not distributed to the press in the usual way, nor even to those who subscribe for copies of all bills in order to keep posted. In fact, as far as Canadian Railway and Marine World is concerned, a copy of it was not received until after it had been read a third time in the Commons, and then it came simultaneously with the Official Report of the Debates which contained the discussion on the third reading. That the attempt to keep the contents of the bill from those interested was deliberate, is proved by the fact that a person who wrote a permanent official of the P.O. Department on May 6, asking for a copy of the bill (two days after it had been read a third time), received an answer from that official, dated May 8, stating that the bill would not be printed until it had been signed by the Governor General. This was an absolute untruth, as Canadian Railway and Marine World had a day or two previous to the date of that letter secured a copy of the bill, and we cannot believe that the untruth was unintentional. We cannot imagine that a permanent official, occupying such a prominent position as the one referred to does, was unaware that it was necessary that the bill should be printed before it could be passed in the Commons. When he gave the answer above stated, the bill had not only been printed for submission to the

Commons, but it had been reprinted as passed by the Commons, and for submission to the Senate. When the discussion on it opened in the Commons the P.M.G. gave an evasive answer as to the effect of some of the amendments proposed, and anyone reading the official report of his remarks cannot fail to come to the conclusion that there was a deliberate attempt to deceive.

The including of the various subjects above referred to in one bill, is in keeping with the cunning which appears to be one of the P.M.G.'s chief characteristics. By putting in the clause respecting newspaper postage rates, and compensation for carrying postmen on electric railways, with other clauses relating to appointments and salaries of railway mail clerks, he attempted to bring it under the head of a money bill, and therefore unamendable by the Senate, but he was unsuccessful.

We do not believe that Mr. Borden had any knowledge of the contents of the bill, before they were brought to his attention after it had passed the Commons. In the multiplicity of his duties he is not blamable for this. We believe he is too high principled to have countenanced such legislation, and we cannot help thinking that when he was informed of what had been done he deeply regretted it.

As pointed out elsewhere in this issue, the electric railway companies had no notice of the portion of the bill affecting them, and no opportunity for making any representation to the Commons. The intention evidently was to "railroad" the bill through the Senate in the same way, but its reference to the Committee on Banking and Commerce, in opposition to the expressed wish of the Government leader in the Senate, prevented this, and an amendment was secured giving electric railway companies the protection which they offered last year to accept, but which the P.M.G. refused, viz., reference to the Board of Railway Commissioners.

The rate of postage to be paid by newspaper publishers for the transportation of their papers has, ever since Confederation, been vested in Parliament. The objection to the P.M.G.'s attempt to take that power from Parliament, and confer it upon himself, is not a question of rates. The publishers object to it because they want stability, and because they do not want to be in the power of any one man, who could change rates as often as he might see fit, and who would have absolute powers of discrimination. Many of them particularly object to such powers being vested in the present P.M.G., who has shown himself impervious to argument or reason, and they object to his successors, whoever they may be, having such power, but they do not object to paying a reasonable rate, to be settled by Parliament. The question of newspaper postage rates has been before the P.M.G. for months. He had ample time to prepare a tariff and present it to Parliament, but he broke faith with the Canadian Press Association, and attempted to steal a power which no one man should possess.

This is not a political question. As soon as the contents of the bill leaked out, protests from newspaper publishers all over Canada, irrespective of their politics, poured into Ottawa, but Mr. Peletier treated them with absolute contempt. When the bill first came up in the Senate, Sir Mackenzie Bowell, an ex-Conservative premier and the ex-government leader in the Senate, said: "Although I appear as a seconder, I do not approve of the bill and I am not to be com-

mitted to it." The representations of the Canadian Press Association were presented by the chairman of its postal committee, P. D. Ross, who is a close personal friend of Mr. Borden, and is the proprietor of the Ottawa Journal, which is generally recognized as the Government organ at the Capital. The Managing Director of Canadian Railway and Marine World, Conservative though he is joined hands with the other opponents of the bill, and did everything possible to ensure its defeat, which was finally accomplished.

The P.M.G. is trying to make political capital out of the action of the majority in the Senate. They simply granted the request of the Canadian Press Association, which was worded as follows: "Resolved, that the executive of the Canadian Press Association hereby respectfully appeals to the Senate to strike out of bill 147 the clause empowering arbitrary changes of newspaper postage."

During the discussions on the bill, and after its defeat, the P.M.G. made several open threats against publishers and others who opposed it, and there is no doubt that if he remains in the cabinet he will have to be reckoned with again in connection with this subject. The Premier is now conversant with the facts. Believing as we do in his high mindedness and absolute probity, we cannot think that he can approve of such arbitrary methods, and we look to him to restrain his colleague. If this is impossible, it would be advisable to transfer the P.M.G. to some other position, preferably outside the cabinet, where his opportunities for the perpetuation of glaring injustice would be at least minimized.

In connection with some of the objectionable provisions and matters of post office department administration, such as the refusal to allow papers to publish two page advertisements, a refusal entirely contrary to the post office regulations as then existing, some of the permanent officials of the department have taken a very prominent part. They would do well to accept a word of warning, and to remember that they are the servants of the people, not its masters. Neglect to realize this, and a continuance of their recent activity, would provoke a public demand which could only be satisfied by drastic changes in the manning of the department.

During the discussion of the P.M.G.'s bill before the Senate committee, a waggish Senator wrote and passed around among his colleagues the following "cablegram":

"St. Petersburg, June 2, 1914.

"To Pelletier, Ottawa.

"How dare you copy my legislation without permission?"

"Nicholas, Czar."

Pacific Coast Collieries.—An issue of \$500,000 of 6% first mortgage and collateral trust 30 year sinking fund gold bonds, is being made by the Company. The issue price is 98 and the bonds carry a bonus of 35% of common stock. The company owns collieries, railways, wharfage and other shipping facilities at South Wellington, Squash, Boat Harbor, Malcolm Island and Oyster Bay, on Vancouver Island, B. C. The present output is 2,500 tons a day, which will slowly be raised to 4,000 tons by the addition of new equipment, and the opening of a new property. The company sends its output over its own railway, selling f.o.b. at its own harbor. The directors are:—Jas. Carruthers, President; R. Bickerdike, Vice President; Sir Thomas Tait, C. P. Hill, Montreal; Hon. P. Ellison, M. P. P.; R. T. Elliott, Victoria, B. C.; A. H. S. McGowan, M. P. P., Vancouver, B. C.; E. Bristol, K.C., M.P., Toronto.

Canadian Northern Railway Construction, Betterments, Etc.

Sir Donald Mann, Vice President, in an interview, June 13, is reported to have said that now the bond guarantee has been sanctioned by the Dominion Parliament, it is expected that all the money required for the completion of the company's undertaking will be raised. Financial conditions, however, change from day to day, but according to present indications the money will be obtained. In the meantime the company will go ahead with all the construction in hand all over the system, and will proceed with such betterments and improvements as are necessary. Some of this work has been held back pending the conclusion of the financial arrangements, but it will now all be proceeded with. It is expected that all the sections of the transcontinental line will be connected within a year, ready for operation. Traffic will be started on the Toronto-Ottawa line very shortly; and the Montreal-Ottawa-Port Arthur line will be pushed forward vigorously. About 300 miles of the main line in the prairie provinces will be relaid with heavier rails, and the remaining mileage will be relaid in 1915. The whole of the line will then have been laid with these heavy rails tying in with the new construction now going on. The rails released will be used on branch lines.

It was reported, June 13, that an order had been placed with the Dominion Steel Co. for 45,000 tons of steel rails.

Mount Royal Tunnel and Terminal Co.—The "break up" stage of construction on the main part of the Mount Royal tunnel was completed May 31, and the excavation of the tunnel on the remaining section under the city streets and on about 700 ft. at the western portal is in progress. The excavation at the station site is being progressed with, a depth of over 20 ft. having been reached. The site will have to be excavated to a depth of 35 ft. A plant has been erected in the Model City for manufacturing concrete blocks to be used for the lining of the tunnel, a work which it is expected to start at an early date. Sir William Mackenzie, D. B. Hanna, H. K. Wicksteed, and L. C. Fritch, paid a visit of inspection to the tunnel works, June 12.

Canadian Northern Ontario Ry.—It was announced that a regular through passenger train service would be put in operation between Toronto and Ottawa, June 29, replacing the previous services.

A passenger train service was put in operation on the spur line, completed four years ago, from Udney, on the Toronto-Sudbury line, into Orillia, June 13. The line is about 10 miles long. Press reports state it is intended to build an extension of this line from Orillia, round the west side of Lake Couchiching, rejoining the Toronto-Sudbury line at Hamlet, thereby enabling the company's trains to run through Orillia.

Canadian Northern Ry.—While no official announcement has been made as to the season's work, it is said that all the construction work in hand will be pushed forward to completion. Arrangements are being made, it is said, to accelerate all the construction work on the branch lines, and to push forward ballasting and other finishing up work on the lines on which track was laid last year. The transcontinental line work to the Albretha Summit is being pushed. The details of the betterment works to be done on the various lines west of Port Arthur, Ont., are being settled.

Application is being made to the Board of Railway Commissioners for authority to build a spur line from between Harold and

Vickers streets, Fort William, northerly, for industrial purposes.

Representatives of the Yorkton, Sask., Board of Trade, reported, recently, that they had been assured by the company's officials at Winnipeg, that the laying of steel on the branch through Yorkton to Willowbrook will be completed at as early a date as possible, and that Yorkton will be made a divisional point.

The Mayor of Medicine Hat, Alberta, is reported to have received a telegram from Sir William Mackenzie to the effect that grading will be started on the line from Hanna, on the Saskatoon-Calgary line, into Medicine Hat, Alta., about 100 miles, in July. The line from Saskatoon and the line from Vegreville effect a junction at Drumheller, from which place there is a single line into Calgary.

It is reported that as soon as ballasting is completed on the Vegreville-Calgary line a daily train service will be put in operation.

The Treasurer of Alberta reports that he has received the balance of the \$6,500,000 received for the bonds of the C.N. Western Ry. This is to be used for branch lines under construction, or to be constructed in the Province. Details of the several lines and of the work done on each were given in our June issue.

Canadian Northern Pacific Ry.—The Premier of British Columbia is reported to have said in a recent speech that this line is being built to a higher standard than called for in the specifications. When the construction of the line was under consideration three routes were looked into, one over the Hope Mountains, one from Howe Sound, and the present one. The latter was selected as offering the best gradients, and furnishing transportation facilities where most required. The fact that the C.P.R. is proceeding with its important second track work, and gradient reduction work, shows the importance of this route. The construction of the important bridge at Cisco was expected to be completed by July 31, after which track laying could be proceeded with along the Thompson River. This bridge is 910 ft. long, and is about the biggest one on the line.

S. K. Sykes, of the company's engineering staff, completed an inspection of the line to the Albretha Summit, June 12. The principal grading yet to be done is along the North Thompson River, where about 80% has been completed. The bridge building is being delayed by scarcity of labor.

Vancouver Island.—It is reported that grading on the Alberni line has been completed to mileage 135. Two routes are under construction from mileage 135 to 140, and grading will be gone on with as soon as it has been decided which route will be adopted. The substructures for the bridges are being put in, and the steel work is being assembled. It is expected that tracklaying will be started on an early day. (June, pg. 272.)

Telephone Dispatching on Intercolonial Ry.—The Dominion Parliament has voted \$64,000 for the installation of telephones in connection with train dispatching on the Intercolonial Ry. The acting Minister of Railways stated that the amount was sufficient to cover the system between St. John, N.B., and Truro, N.S. The contract has been awarded to the Hall Switch and Signal Co., for the installation between Moncton and St. John, N.B., and tenders are under consideration for the extension from Moncton to Truro.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—J. D. McArthur, the general contractor for this line, is reported to have stated in Edmonton, Alberta, June 11, that grading had been sufficiently advanced to permit of tracklaying being gone on with. (June, pg. 266.)

Alberta Pacific Ry.—See Western Dominion Ry.

Algonquin Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from the C.P.R. west of Blairmore, Alberta, northerly and westerly through townships 8 and 9, range 4, west of the 5th meridian, to the centre of sec. 20 in tp. 19, about 15 miles. The company's offices are in Vancouver, B.C. and its provisional directors are:—G. H. Salmon, C. A. Hancock, R. P. Stockton, R. Smith, J. A. Harvey.

The Atlin Ry. Co. has been incorporated by the Dominion Parliament to build a railway from the southern end of Atlin Lake, B.C., in a generally southerly direction to the Taku River, where it crosses the International Boundary between British Columbia and Alaska. United States press reports state that preliminary surveys are being made by a party in charge of F. J. Wetrick, who, it is stated, has just completed a preliminary survey for a railway from Taku Inlet, Alaska, along the Taku River Valley to the Alaska-B.C. boundary. Plans of this survey, which has been made under the charter of the Taku Ry. and Navigation Co., have been filed at Juneau, Alaska. (April, pg. 165.)

Burrard Inlet Tunnel and Bridge Co.—We are officially advised that the company has not yet decided upon a design for the projected bridge across the Second Narrows of Burrard Inlet. The position in regard to this matter now is, that the cost of the construction of the bridge on the plans prepared by Sir J. W. Barry, London, Eng., and approved by the Dominion Government, was in excess of the money at the command of the company, and the Barry engineering contract has been cancelled by mutual agreement. Certain alternative and cheaper plans were submitted by bridge builders, and these are under consideration. Local labor and other interests are urging that the steel for the superstructure be fabricated in local shops, and the directors are investigating to see how far this could be done. (June, pg. 266.)

Calgary and Fernie Ry.—We are officially advised that the officers for the current year are:—President, J. S. Hough, K.C., Winnipeg; Vice President and General Manager, F. Crandell, Calgary; Secretary-Treasurer, W. J. Ball; Chief Engineer, H. B. Ferguson, and that it is the intention to begin construction during this year of the whole line from Fernie, B.C., to Calgary, Alta., 150 miles. The whole route plans have not yet been finally approved by the Minister of Railways, nor the location plans by the Board of Railway Commissioners.

The Minister of Railways has approved of the route map from Fernie to 18 miles from Calgary. The route for this 18 miles paralleled that laid out by the Western Dominion Ry., and the Minister has approved of that company's route, provided that running rights be given over it to the C. and F. Ry. If the W.D. Ry. does not begin its own line within three months, and complete it within a reasonable time, the C. and F. Ry. may build on its own survey into Calgary.

The Grain Belt Construction and Development Co., Calgary, Alta., of which F. Cran-

dell is Manager, is interested in the construction of the C. and F. Ry., the High River and Hudson Bay Ry., and the High River, Saskatchewan and Hudson Bay Ry. This company has a capital of \$165,000, and is being financed largely in England. (June, pg. 266.)

Edmonton, Dunvegan and British Columbia Ry.—The Board of Railway Commissioners has approved of location plans for the line through townships 77 and 78, ranges 19 to 23, and through townships 74-77, ranges 18 and 19, west of the 5th meridian, Alberta. (May, pg. 213.)

Esquimalt and Nanaimo Ry.—It was expected to have track laid to Courtenay, B.C., on the extension from McBride Jct., by June 30. The last report of the progress of the work prior to that date was that the superstructure on the Trent River bridge was being put in place by the Dominion Bridge Co. The ballasting gang is working close behind the tracklayers, and as the buildings in Courtenay are completed it is expected to have a train service in operation early in July. (June, pg. 266.)

Glengarry and Stormont Railway.—So far it has been impossible to obtain any official information about this company's proceedings. Its office is at 43 St. Francois Xavier Street, Montreal, in the offices of G. W. Farrell & Co., stockbrokers, etc., who were also interested in the financing of the Lake Erie and Northern Ry. It is believed that they are acting in connection with the C.P.R., and that that company will take over and operate the line when completed. A contract for the construction of the line is said to have been given to the Glengarry Construction Co., 400 St. James St., Montreal, and subcontracts are also reported to have been let, and it is said that construction is in active progress. As previously stated the line is to run from St. Polycarpe, on the C.P.R. Montreal-Toronto line, to Cornwall, Ont. (May, pg. 213.)

Ha Ha Bay Ry.—We have been officially advised that during 1913 about four miles of the branch to Laterriere, Que., and the mile of the branch to the wharf at Bagotville, Que., were completed. Some work was done in 1912, but the lines were finally completed in 1913. (June, pg. 266.)

High River and Hudson Bay Ry.—We are officially advised that the officers for the current year are:—President, R. J. Wallace, Vice President and General Manager, F. Crandell; Secretary-Treasurer, H. N. Shappard; Chief Engineer, H. B. Ferguson. The second and last of these hold similar offices in the Calgary and Fernie Ry. Route plans for this railway are before the Minister of Railways for approval, and location plans for about 100 miles of line east and west of High River, Alta., are completed. (Mar., pg. 121.)

High River, Saskatchewan and Hudson Bay Ry.—We are officially advised that route plans have been prepared for this projected railway, and will be submitted for the approval of the Minister of Railways at once. (Mar., pg. 121.)

Intercolonial Coal Mining Co.—The Nova Scotia Legislature has authorized the affixing of the provincial guarantee to the principal of a loan not exceeding \$100,000 to aid the company in developing the coal mining properties formerly owned by the Acadia Coal Mining Co., and situated near New Glasgow. In connection with the mines several lines, aggregating 14 miles in length, connecting them with New Glasgow and other points, were built. Sir H. Montague

Allen was President of the Acadia Coal Co., and C. Fergie is President of the I.C.M. Co. (See Acadia Coal Co., Sept., 1910, pg. 725.)

Intercolonial Ry.—Work is reported to be well advanced on the spur line at Pugwash Harbor, and it is expected that it will be opened for traffic by July 30.

The following sums have been voted by Parliament:—Diversion of line and branch to wharf, Chatham, N.B., \$10,000, capital account; second track work, Chaudiere Jct. to St. Romuald, Que., \$160,000; diversion of line between Nelson and Derby Jct., N.B., \$108,000; increased accommodation at Fredericton, N.B., \$10,000, representing the unexpended portion of a vote of last session; general protection of highways, \$66,000; subway and facilities at Hampton, N.B., \$40,000; elimination of level crossings, \$100,000; increasing accommodation along the line generally, \$200,000.

Details of the work in progress on the Chatham and Nelson divisions, and on the Chaudiere Jct. second track work, have already been given in previous issues, the present votes being to carry on and complete the work. In respect of the general protection of highways it was explained that the work on the list for this year is estimated to cost \$153,000. (June, pg. 266.)

Kettle Valley Lines.—The revised route map of the last section of the K.V. Lines in British Columbia to be put under contract, which has been approved by the Minister of Railways, shows a line starting at mile 60, on the original approved route, and tying in again with it at mile 110, Otter Creek Summit. The new route reaches Princeton at mile 70, and joins the Vancouver, Victoria and Eastern Ry. about three miles further on, and passing through Coalmount, Tulameen, and along Tulameen Lake and Otter Creek to the Summit. The V.V. and E. Ry. is practically completed to Tulameen. The original route on the section, which starts at Siwash Creek, followed the Five Mile Creek to mileage 60, where the new route deviates, then crossed to the Summers Creek Valley, which was followed to and along Pastazoula Lake, thence worked over to near Aspen Grove, and along one of the forks of Otter Creek to the Summit. The section is being built by Galbraith & Co., and from Princeton to the Summit will be operated as a joint section with the V.V. and E. Ry. It is understood that at a future date, when the development of the country warrants, the line will be built over the original route. (June, pg. 266.)

Labrador, Quebec and Southern Ry.—The House of Commons declined to concur in the Senate amendment that this company's line was one "for the general advantage of Canada," on the ground that it might be construed to contain a tacit admission that there was a boundary between the Canadian and the Newfoundland Labrador. The particular territory in dispute forms the subject of a reference to the Imperial Privy Council, to be argued during the summer. The effect of this decision was that the bill was killed. (June, pg. 266.)

Lake Erie and Northern Ry.—The work of finishing up the line between Brantford and Galt, Ont., is nearly completed, and it is expected to have a regular train service in operation very soon. In Brantford work was started June 8, on the retaining wall at the Lorne Bridge, which was expected to be raised to the new level by June 30. No construction is in progress on the line between Brantford and Waterford, and local reports state that it is likely the company will run its trains over the Toronto, Hamilton and Buffalo Ry. between these two points. Beyond Waterford and

Port Dover work has been restarted, and considerable progress is being made. A number of C.P.R. engineers, who were engaged on the second track work between Islington and Guelph Jct., were ordered to report on the work, and a C.P.R. bridge construction gang was sent to Simcoe.

It was stated in Brantford, June 17, that any intention of utilizing the T.H. and B.R. station in the city, and the T.H. and B.R. line between Brantford and Waterford, had been abandoned. The L.E. and N. Ry. will, it is stated, build its own station in the city, and its own line to Waterford.

Montreal Central Terminal Co.—An issue of £1,028,000 of 5% first mortgage bonds was offered on the London, Eng., market, June 4, at 90. The prospectus states that they are to be secured on a first mortgage on the company's central station proposed to be built on Ontario St., Montreal, with yards, warehouses, etc., in connection therewith, and the railway lines to be built between the central station and the points of junction near Bordeaux, Montreal, with railways entering Montreal from the north and west. It is asserted that the proposed system of the company's railways will, when completed, be connected with at least 12 railway lines, and will exchange traffic therewith. The directors are:—C. Newhouse Armstrong, London, Vice President; Central Ry. of Canada, President; J. E. Wilder, manufacturer, Montreal; Hon. T. Berthiaume, M.L.C., Proprietor, La Presse, Montreal; Sir Thomas H. C. Troubridge, London; A. E. Labelle, Harbor Commissioner, Montreal; F. H. Allen, New York, and F. E. Came, M. Can. Soc. C.E., Montreal; Sir Douglas Fox and Partners, London, are consulting engineers, and the City Safe Deposit and Agency Co., Ltd., London, are trustees for the bondholders.

The prospectus also states that several railways have at present only a restricted access to the centre of the city, and that there is no effectual means of traffic exchange between the several lines, and that additional traffic connection with the south of the city is required. It is expected, adds the prospectus, that the yards will be sufficiently advanced to permit of their use by July, 1915, and fully completed in Dec., 1915, from which it is estimated that there will be, after providing for bond interest, a surplus of \$347,935 from railway revenue alone. When the proposed tunnel to the south shore is completed, the revenues would be largely increased.

Pacific, Peace River and Athabasca Ry.—D. A. Thomas, President, Cambrian Collieries Trust Co., who is also President of the P.P.R. and A. Ry. Co., returned to London, Eng., recently from a trip to Western Canada, and is reported to have stated that adequate financial arrangements had been made for starting construction on the railway, and also for the electric lines proposed to be built under the charter of the Peace River Tramway and Navigation Co. It was not expected, however, to go on with construction on the latter lines this year.

The surveys for the Nasoga-Groundhog section of the line show a route of about 150 miles. Local press reports state that negotiations have been in progress with Sir Donald Mann with a view to the line built from Stewart, B. C., inland for 14 miles, and surveyed to the Groundhog district, under the charter of the Canadian Northern Eastern Ry. being utilized as part of the company's line. This line would be 105 miles in length to the Groundhog district, and is not at present being operated. (June, pg. 267.)

Pacific Great Eastern Ry.—Grading has been completed on the extension from Dundarave to Horseshoe Bay, B.C., and the

steel bridge work is in progress. It is expected to have a train service in operation from North Vancouver to Horseshoe Bay by the end of July. Work is in progress between Horseshoe Bay and Squamish, the ocean terminal. On the terminal site a large quantity of filling is being done along the foreshore. From Squamish the line is under construction practically through to the junction with the G.T. Pacific Ry. at Fort George. We are officially advised that contracts have been let for construction on this line north of Clinton, B.C., as follows:—Madden Bros., Clinton, 6 miles; Rankin and Kellett, Clinton, the next 20 miles; Welch and Kennedy, Clinton, the next 4 miles. The remaining mileage is expected to be put under contract in August.

The projected extension from Fort George to a junction at B.C.-Alberta boundary with the Edmonton, Dunvegan and British Columbia Ry. is under survey. (June, pg. 267.)

Pere Marquette Rd.—The company has under construction at Blenheim, Ont., a 100-ton coal chute, of reinforced concrete, with elevators. The floor level is 23 2-3 ft. below the rail level, and the coal will be elevated by hoppers 75 ft. to a chute, from which it will be dropped into the tenders. It is expected the plant will be completed by July 31. (July, 1913, pg. 332.)

Quebec and Saguenay Ry.—The Premier recently stated in the House of Commons that the Government was not aware that the Canadian Northern Ry. was going to buy the Q. and S. Ry., or that there was any arrangement for its purchase of the line if the C.N.R. guarantee was finally passed. The Q. and S. Ry. is a partially constructed line, upon which construction has ceased owing to financial difficulties. (June, 1913, pg. 278.)

Reid Newfoundland Ry.—A loan of \$2,000,000 has recently been placed in London, Eng., by the Colonial Government to complete the construction of the branch lines arranged for five years ago. The agreement provided for the building of six branches, aggregating about 400 miles. The Bonavista Bay branch, 90 miles, was completed in 1911; the Trepassey branch, 104 miles, is expected to be completed early this summer; the Carbonear-Grale's Cove branch, 45 miles, is completed. Considerable work has been done on the other branches, which will serve the Heart's Content and Fortune Bay districts, and it is expected to have them ready for the completion of tracklaying this season. (May, pg. 215.)

St. John and Quebec Ry.—The Dominion Parliament, at its recent session, provided for the guarantee of bonds for \$3,000,000 for building three bridges on the line, at Andover, at The Mistake on the St. John River, and over Kennebecasis River at Parry Point, N.B. It was stated in explanation that a certain amount was provided in 1912 for the erection of these bridges, but it had since been found that they could not be built for the money. As the line, when completed, is to be operated as a part of the Intercolonial Ry., the Government decided to grant the further aid required. The original subsidy was to be given by a guarantee of bonds, the Government to pay the interest for a fixed period. It has now been decided that the Government will build the bridges, with their approaches, and the railway will be granted the free use of them for 15 years, after which the gross earnings of the bridges will be receivable by the Department. The gross earnings of the bridges is to be such proportion of the gross earnings of the railway as the cost of the bridges bear to the combined cost of the bridges and the railway. It is estimated that the bridges will cost about \$3,000,000. The original agree-

ment provided for the guarantee of bonds for \$1,000,000 towards the building of these bridges. (June, pg. 267.)

Toronto, Hamilton and Buffalo Ry.—At a dinner in Brantford, Ont., June 4, during the excursion of the Hamilton, Ont., Board of Trade, G. C. Martin, General Freight and Passenger Agent, T.H. and B. Ry., is reported to have said that all arrangements had been completed by the company for a branch line from Smithville to Dunnville, Ont., and that construction work would be started very soon. The line is to be ready for operation by Jan. 1, 1915. (June, pg. 267.)

The Western Dominion Ry. Co. was originally incorporated by the Dominion Parliament in 1912, and Parliament has now extended the time for starting construction for one year, and authorized amalgamation with the Alberta Pacific Ry. under the title of the W.D. Ry. Co. O. E. Culbert, Calgary, Alta., is Secretary. We are advised that contracts are about to be let for the building of the first section of the line.

Press reports state that it has been arranged to start work immediately, and that instead of building about 100 miles as originally proposed, the line will be extended to the International boundary, and there make connection with a branch of the Chicago, Milwaukee and St. Paul Ry., now under construction from Gerent Falls, Mont. The financing for the construction of the section of the line from Calgary to the newly discovered oil regions, it is said, has been arranged, and it is reported that a site for yards, etc., has been secured on the Canadian Petroleum Products Co.'s townsite. The line will touch Okotoks, Pekisro, Lunch Creek (crossing the Crownest Pass line of the C.P.R.), Pincher Creek and Cardston, and run to the International boundary. W. C. Peter, New York, is President of the W.D.R. Co. M. M. Mann, Chief Counsel of the Chicago, Milwaukee and St. Paul Ry., is a director, and J. H. N. Cornell is Chief Engineer.

The Minister of Railways has approved of the route from Calgary on condition that construction is started within three months, and has granted the Calgary and Fernie Ry. running rights into Calgary from 18 miles out. If this section of the line is not started within the three months and completed within a reasonable time the C. and F. Ry. may then build on its own survey.

A press dispatch states that a contract for grading on the first 100 miles from Calgary has been let to the G. H. Webster Co., Calgary, and a contract for 4,000,000 ft. of timber trestle work, and 12,000 cubic yards of concrete culverts to the Forest City Paving Co., Calgary. (June, pg. 268.)

Winnipeg.—The Mayor of Winnipeg and a deputation from the City Council made a trip of inspection, on June 10, over the railway line under construction from Transcona to Shoal Lake, Man., in connection with the Greater Winnipeg Water Supply. A large amount of construction has been done and 2.5 miles of steel had been laid on the main line. (May, pg. 215.)

Master Boiler Makers' Association.—The eighth annual convention was held at Philadelphia, Pa., recently under the presidency of T. W. Lowe, General Boiler Inspector, C.P.R. A report was submitted by H. W. Armshaw, C.P.R., relating to experiments on the C.P.R. Western Lines in connection with water treatment.

There are said to be 95 gravity or hump yards, on 30 different railway systems. Of these, four are known to be in Canada, three on the C. P. R., and one on the Michigan Central Rd.

Transportation Appointments Throughout Canada.

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

Canada Steamship Lines, Ltd.—M. CUSSEN, heretofore Auditor Passenger Receipts, has been appointed Assistant to the Comptroller. Office, Montreal.

J. T. BRENNAN has been appointed Auditor of Passenger Receipts. Office, Montreal.

Canadian Northern Ry.—D. CROMBIE, heretofore Inspector of Transportation, Pere Marquette Rd., Detroit, Mich., has been appointed Inspector of Transportation, C.N.R. Office, Toronto.

Canadian Pacific Ry.—N. S. DUNLOP, heretofore Tax and Insurance Commissioner and Claims Adjuster, has been appointed Insurance and Tax Commissioner. The company's fire and marine insurance and matters relating to general taxation will hereafter be under his supervision. Office, Montreal.

F. R. HANEY, heretofore Assistant Tax and Insurance Commissioner, has been appointed acting Claims Adjuster, vice N. S. Dunlop, Tax and Insurance Commissioner and Claims Adjuster, appointed Insurance and Tax Commissioner. Office, Montreal.

R. W. McCORMICK, heretofore Superintendent, District 3, Eastern Division, Montreal, has been appointed Superintendent, District 1, Eastern Division, vice W. B. Way transferred. Office, Farnham, Que.

J. K. McNEILLIE, heretofore Superintendent, District 2, Eastern Division, has been appointed Superintendent, District 3, Eastern Division, vice R. W. McCormick transferred. Office, Montreal.

JAMES M. BARRETT has been appointed Superintendent, District 2, Eastern Division, vice J. K. McNeillie transferred. Office, Windsor St. Station, Montreal.

F. M. BREEN has been appointed Superintendent, Sleeping, Dining and Parlor Cars and News Service, District 1, which embraces lines east of Toronto and Sudbury. Office, Glen Yard, Montreal.

JOHN PRENDERGAST, heretofore fitter, has been appointed assistant foreman at Glen Yard, Montreal, vice M. Miller, promoted.

M. MILLER, heretofore assistant foreman at Glen Yard, Montreal, has been appointed Locomotive Foreman, Ottawa, vice R. H. McDonald, who returns to the bench.

R. L. JOHNSTON, heretofore Assistant Trainmaster, Farnham, Que., has been appointed Assistant Trainmaster, Toronto. This is a new position. The former position has been abolished.

J. McAULEY, heretofore extra gang foreman, North Bay, Ont., has been appointed Roadmaster, North Bay Subdivision, Lake Superior Division, Mattawa, Ont., vice W. Owens transferred.

F. JOHNSON, heretofore Day Shop Foreman, Winnipeg, has been appointed Night Locomotive Foreman, Transcona, Man.

Dr. A. W. MOODY, has been appointed Chief Surgeon, Manitoba Division, Winnipeg, vice Dr. R. J. Blanchard, resigned, and not Chief Surgeon, Western Lines, as reported in our last issue.

J. M. WILLARD, heretofore Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Manitoba Division, Winnipeg, has been appointed Assistant General Superintendent, same department, Western Lines. Office, Winnipeg.

E. E. JOHNSON has been appointed Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Mani-

toba Division, vice J. M. Willard promoted. Office, Winnipeg.

R. SPROULE, heretofore foreman at Fort William, Ont., has been appointed Day Shop Foreman, Winnipeg, vice F. Johnson promoted.

JAS. DUNCAN, heretofore section foreman, Arborg District, has been appointed Assistant Roadmaster, Winnipeg.

C. G. WASHBON, heretofore Resident Engineer, Brandon, Man., has been appointed Trainmaster, Souris, Man.

F. A. BOWELL, heretofore at Sutherland, Sask., has been appointed Locomotive Foreman, Moose Jaw, Sask., vice C. H. Baynam, transferred.

C. H. BAYNHAM, heretofore Locomotive Foreman, Moose Jaw, Sask., has been appointed Locomotive Foreman, Swift Current, Sask., vice A. J. Pentland, transferred to Ignace, Ont., as announced in our last issue.

J. A. MacGREGOR has been appointed Acting Superintendent, District 2, Alberta Division, vice F. Walker, on leave of absence. Office, Calgary.

H. M. TAIT, heretofore General Agent, Passenger Department, Minneapolis, Minn., is reported to have been appointed General Agent, Passenger Department, Calgary, Alta.

T. J. WALL, heretofore General Agent, Passenger Department, Spokane, Wash., has been appointed General Agent, Passenger Department, Minneapolis, Minn., vice H. M. Tait, transferred.

Grand Trunk Pacific Ry.—The following station agents have been appointed:—Lazare, Man., G. A. Swan; Coblenz, Sask., W. H. Bergman; Mawer, Sask., W. Norman.

Grand Trunk Ry.—H. H. HAMILL, heretofore Travelling Freight Agent, New York, has been appointed Commercial Agent, Detroit, Mich., vice Jas. McPeak, on temporary leave of absence.

J. B. GAUT, heretofore Assistant Engineer on valuation, has been appointed Superintendent of Bridges and Buildings, Chicago, Ill., vice C. O. Busbey.

The following station agents have been appointed:—St. Liboire, Que., A. E. Boulay; Napanee, Ont., G. V. Savage; Washago, Ont., S. Johnston; New Hamburg, Ont., H. Phillips; Brussels, Ont., J. L. Taylor; Dalkeith, Ont., D. J. McIntosh; Golden Lake, Ont., J. L. Foster; Wilno, Ont., P. J. Corkery; Edgington, Ont., J. M. Smith; Burnt River, Ont., W. Ellis; Grimsby Beach, Ont., Pass., F. B. Russ.

Greater Winnipeg Water District.—J. C. NELSON is reported to have been appointed Traffic Superintendent of the railway which is being built from Winnipeg to Shoal Lake, in connection with the construction of the Greater Winnipeg Water District supply.

Great Lakes Transportation Co.—JAMES PLAYFAIR, formerly Vice President and General Manager, Richelieu and Ontario Navigation Co., has been elected President, Great Lakes Transportation Co.

D. J. BOURKE has been appointed Traffic Manager. Office, Windsor, Ont.

Northern Navigation Co.—J. I. HOBSON, Treasurer, Canada Steamship Lines, Ltd., Montreal, has also been appointed Treasurer, N.N. Co.

F. S. ISARD, Comptroller, Canada Steamship Lines, Ltd., Montreal, has also been appointed Comptroller, N.N. Co.

J. T. BRENNAN has been appointed Auditor Passenger Receipts. Office, Montreal.

F. SCARLETT has been appointed Auditor Freight Receipts. Office, Montreal.

Ottawa and New York Ry., New York Central and Hudson River Rd.—S. R.

PAYNE, heretofore Assistant to General Manager, N.Y.C. & H.R.R., Rochester, N.Y., has been appointed Manager, O. & N.Y.R., and of the Ottawa Division, N.Y.C. & H.R.R., vice H. W. Gays, deceased. Office, Ottawa, Ont.

Reid Newfoundland Co.—J. M. LYONS, formerly General Passenger Agent, Intercolonial Ry., Moncton, N.B., is reported to have been appointed Eastern Traffic Agent, Reid Newfoundland Co., with office at Moncton, N.B.

Toronto, Hamilton and Buffalo Ry.—W. T. KUHN, heretofore Master Mechanic, has been appointed Superintendent of Motive Power, the duties of Master Mechanic being handled through his office. Office, Hamilton, Ont.

Winnipeg Commercial Traffic Men's Association.

The objects of this association are the organization of men having charge of traffic or customs matters for merchants and manufacturers in Winnipeg and district, for the purpose of correcting irregularities and inconsistencies in charges for transportation and to deal with disputes which may arise between members of the association and transportation companies; to secure improved transportation; the gathering and dissemination of data in relation to subjects of interest to members; the amendment of business customs whereby commercial interests may be benefited; to deal with matters regarding customs charges and regulations; to affiliate with other organizations where it is thought such affiliation will serve the best interests of the association; to establish closer ties of business association, and such other objects as members of the association may determine. The membership consists of men engaged in handling transportation and customs matters for mercantile and manufacturing businesses, each firm or company being limited to one vote.

The officers are:—President, T. H. Van Every, Traffic Manager, Marshall Wells Hardware Co.; Vice President, F. C. Barnes, Traffic Manager, Stobarts, Ltd.; Secretary-Treasurer, G. E. Carpenter.

Track Elevation in Montreal.—The City Engineer's department submitted a report to the Board of Control, June 15, dealing with the question of the elimination of level crossings and grade separation in Longue Pointe Ward. The report states that the railway tracks in the ward will ultimately have to be elevated, as it would not be wise to adopt a policy of subways. The estimated cost of the work at eight different points would be \$4,000,000. At present neither the street railway traffic nor the railway traffic is sufficiently dense to justify the work being undertaken. The Board was recommended to take the necessary steps to apply to the Board of Railway Commissioners for establishing level crossings at the points suggested, as there is at present only one point at which the people have a legal right of crossing within over three miles.

C. P. R. Shares.—Information published recently shows that the 2,600,000 shares outstanding are distributed among 34,589 shareholders. Of these 9,466 hold 10 shares each, 17,473 20 shares each, 26,834 50 shares each and under, 30,203 100 shares each and under, and 32,599 200 shares each and under. Nearly all the 4% perpetual debenture stock and the 4% preference stock is held in Great Britain, and of the common stock, Great Britain holds about 60%, the European Continent about 15%, and about 23% is evenly divided between Canada and the United States.

National Transcontinental Railway Construction.

The Dominion Parliament has passed an act amending sec. 9, chap. 71, of the statutes of 1903, as amended by sec. 1, chap. 39, of the statutes of 1912, constituting the National Transcontinental Railway Commission, providing that the Minister of Railways shall be eligible to be appointed to discharge the duties of such commissioner, and that after the completion of the line and before its being leased to the G.T. Pacific Ry., the Minister shall have power to operate the line in whole or in part, as a Government railway under the provisions of chap. 36, of the Revised Statutes of 1906.

The House of Commons, on June 5, voted \$6,666,666.66 on account of construction of the line, and on June 8, a further sum of \$1,000,000 was voted on construction account. In the course of the discussion on these votes, the acting Minister of Railways stated that the "sags" on the line, about which complaint had been made, were to be found between 200 miles east and 100 miles west of Cochrane, Ont.; there are 32 "sags" in all, and \$200,000, according to the estimate of the Chief Engineer, will be sufficient to remove them all. The two east of Cochrane could yet be removed by the contractors, and those west could be removed either by contract or by the G.T. Pacific Ry. after the line is taken over for operation. The "sags," or momentum gradients, were left in the line in order to accelerate its completion, with the intention of removing them at a later date. It was subsequently announced that the Government intended to remove them, so that the line will have the original gradient all through.

A vote of \$1,000,000 was made towards the construction of a branch line into Montreal. It is the intention of the Government, the Minister of Railways stated, to have surveys made at once, and some construction may be undertaken. The Premier added that the line will be about 300 miles long, and will have to be built through a pretty rough country. A subsidy had been voted for a line from Montreal to the N. T. R., but it had not been possible for the private owners to carry out the plan. As a matter of fact two lines have been projected to give this connection, one the Joliette and Lake Manuan Colonization Ry., and the other the North Ry., which, projected to a point on Hudson Bay, would cross the N.T.R. at Belle River.

It is expected that an early start will be made upon the building of a railway station and a covered platform on the Champlain market site, Quebec. The tenders for this work are under consideration by the Government.

A further sum of \$1,000,000 has been voted by the Dominion Parliament on account of the construction of the Quebec Bridge. (June, pg. 274.)

Grand Trunk Pacific Railway Construction.

J. G. LeGrand, Bridge Engineer, Grand Trunk Pacific Ry. and President, Western Canada Railway Club, in speaking at a meeting of the club in Winnipeg recently, in reference to the construction of the G.T. P.R., said the first sod was turned on Aug. 29, 1906, near Pine Creek, about 12 miles north east of Carberry, Man., by James Howard, foreman of the Macdonald MacMillan Co. The first track was laid in Oct., 1906, west of Portage la Prairie. The first regular train left Winnipeg for Ed-

monton, Sept. 21, 1908. Since Oct., 1906, 1,747.4 miles of main line have practically been built; also 1,283 miles of branch lines. Adding 600 miles for sidings, terminals, tracks for ballast pits, etc., it means that about 3,600 miles have been built in about 2,300 working days, which is an average of over 1½ miles a day. If to this is added the part of the line built by the National Transcontinental Ry. Commission between Moncton and Winnipeg it means that pretty nearly three miles a day have been built during the past seven years.

The Dominion Parliament has guaranteed a further issue of bonds for \$16,000,000, at 4%, redeemable in 1962, in order that the line may be completed. They are secured by a new trust deed in which all the property of the company is mortgaged, subject to the mortgages already created, and such priority of other charges as may hereafter be created, as shall be approved by the Governor in council. It is also provided that no part of the funds obtained from the sale of the bonds shall be used other than for expenditure approved by the Government for three-fourths of the cost of the Mountain Division, inclusive of interest on bonds issued for the completion of that section, and of interest upon advances made under the Loan Act of 1913, and for interest upon the present securities until the expiration of three years after the final completion of the line from Winnipeg to Prince Rupert. The company and the G.T.R. shall join in a release of all rights to any further guarantee, payment or aid of any description in respect of the building of the line. The date final for the completion of the line is extended to Dec. 31, 1915.

M. Donaldson, Vice President and General Manager, after a trip of inspection over the line as far as Prince George, B.C., recently is reported to have stated that there was a gap of 150 miles on which there was a good deal of work to be done before regular trains could be operated over it. The ballasting and station building work is reported completed as far west as Prince George, and the steel bridge across the Fraser River there is practically completed. This replaces the wooden trestle built to enable the line to be laid into the town. Ten steam shovels with large gangs of men are ballasting the line west of Prince George to the point where the gangs working east are engaged in similar operations. It is expected that all the work will be completed by Dec. 31.

It is expected that the company's floating dock at Prince Rupert will be completed by Dec. 31. The ship repairing plant, in connection with the dock, is rapidly approaching completion.

Grand Trunk Pacific Branch Lines.—We are officially advised that the company's engineers have no information as to the intention to construct a new coal handling plant at the mouth of Mission River, Fort William, Ont., as stated in recent press reports.

Grading was reported as being practically completed June 16, on the branch line from Talmage into Weyburn, Sask. Tracklaying was expected to be done by June 30. The terminal site in Weyburn has been laid out, but no buildings have been erected.

It is expected that the line from Regina to Moose Jaw, Sask., will shortly be opened for traffic. From Moose Jaw, the line now extends to Mawer, to which point a train service is in operation. Track has been laid for some distance on the 10 miles of grading completed northwesterly of Mawer. The present end of construction on this line is at the South Saskatchewan River, but it is expected that at a later period this branch will be extended to the

main line, and when this work is completed it will enable trains to be run through from Northgate, on the International boundary, via Regina to two points on the main line—one east and one west.

A daily passenger service was put in operation on the line into Calgary, Alta., June 7, replacing the weekly service heretofore given; and a daily freight service was started June 8. The question of building a track for the transfer of freight with the C.P.R. is under consideration. (June, pg. 274.)

British-Canadian Financial House in Difficulty.

The banking house of Chaplin, Milne and Grenfell, Ltd., London, Eng., suspended payment recently, and its affairs were taken over for liquidation by a committee of bankers, including, it is stated, the Bank of England, the Bank of Montreal, and R. Fleming, who is largely interested in the Lake Superior Corporation. The suspended bank was heavily interested in G.T.R. stocks, and other Canadian securities, particularly in Western Canada lands. Following this suspension, on June 8, the Canadian Agency, Ltd., of which A. M. Grenfell was chairman, also went into liquidation, Sir William Pender being given charge by the courts. It is stated that while the liabilities of the bank are very heavy, they will be met in full as the securities held are valuable, but not readily realizable, and that the suspension of the bank is due almost entirely to its advances to the Canadian Agency. This institution, according to statements made, was endeavoring to secure such an interest in the G.T.R. as would ensure the establishment of a directorate in Canada "not hostile to the London Board"; also the accumulation of Lake Superior Corporation stock "in order to reform its affairs." The L.S.C. owns the Algoma Central and Hudson Bay Ry., the Algoma Eastern Ry., the Algoma Central Terminals Co., electric railways at Sault Ste. Marie, Ontario and Michigan, and various industrial companies. The Agency was also dealing in Canadian Northern Ry. securities. Various estimates have been made as to the liabilities to the public, but nothing can be known definitely until the official liquidator has made his investigation. It is expected, however, that the net liability, outside the few shareholders of the Agency, will be smaller than at first estimated.

Block Signalling on the Intercolonial Ry.—On a vote of \$100,000 for the installation of block signalling on the Intercolonial Ry. in the House of Commons, recently, the acting Minister of Railways stated that the system had been established from St. John to Hampton, N.B., 20 miles; Moncton to Painsec Jct., N.B., 7 miles; Windsor Jct. to Halifax, N.S., 1 mile, and Truro to Oxford Jct., N.S., 46.5 miles. In connection with additional installations, he stated that the heaviest part of the work will be finished next year, but he did not know that all the road will necessarily be under the block system.

American General Baggage Agents' Association.—At the annual convention at Detroit, Mich., June 17 to 19, G. Alley, General Baggage Agent, Union Pacific Rd., was elected President, and J. P. Dugan, Baltimore and Ohio Rd., Vice President, for the current year, while J. E. Quick, General Baggage Agent, G.T.R., and G. T. Pacific Ry., was elected Secretary-Treasurer, for the 30th consecutive year. It was decided to hold the 1915 convention at Los Angeles, Cal.

Mainly About Transportation People.

G. M. BOSWORTH, Vice President, C.P.R., returned to Canada, June 10, from England.

Lady Tait, wife of SIR THOMAS TAIT, and Miss Tait, are spending the summer in Maine.

A. W. SMITHERS, Chairman of the Board, G.T.R., has arrived in London, Eng., after his annual visit to Canada.

C. NUGENT, a C.P.R. bridge inspector, was killed at Hamilton, Ont., June 1, by being thrown from his motor cycle.

MARSHALL MacGREGOR, General Canadian Agent, Erie Rd., Toronto, was married there, June 4, to Miss M. A. Hettger.

HON. H. R. EMMERSON, M.P. for Westmorland, N.B., is reported to be seriously ill at his home in Dorchester, N.B.

Mrs. Elliott, wife of E. C. ELLIOTT, chief clerk, Passenger Department, G.T.R., Montreal, died there, June 12, after a long illness.

F. A. SKELTON, Secretary-Treasurer, Canadian Car and Foundry Co., Ltd., Montreal, has been elected a director of the company.

SIR WILLIAM VAN HORNE, accompanied by his son, sailed from Quebec, June 4, for England, expecting to return about the middle of July.

D. B. SCOTT, who retired as Chief Electrician, Intercolonial Ry., about two years ago, died at Moncton, N.B., recently, after a long illness.

C. A. BENNETT, chief clerk to General Manager, Eastern Lines, C.P.R., Montreal, has resigned to join the North American Life Assurance Co.'s staff.

R. HOBSON, Vice President and General Manager, Steel Co. of Canada, has been elected a director of the Bank of Hamilton, to succeed the late Senator Gibson.

C. N. MONSARRATT, M. Can. Soc. C.E., Chairman and Chief Engineer, Board of Engineers, Quebec Bridge, returned to Montreal, June 6, from Great Britain.

W. B. LANIGAN, Assistant Freight Traffic Manager, Western Lines, C.P.R., returned to Winnipeg, June 3, after a holiday trip, with Mrs. Lanigan, to Japan.

DAVID POTTINGER, I.S.O., formerly Assistant Chairman, Government Railways Managing Board, Moncton, N.B., and Mrs. Pottinger, are spending some time in Europe.

R. LOWE, who died at London, Ont., June 8, aged 82, was in the G.T.R. service for over 50 years. He was retired under the pension rules some time ago when acting as Roadmaster.

T. R. McCARTHY, who acts as agent for a number of vessels trading to Montreal, has recovered from a serious illness involving an operation, and has left the Montreal General Hospital.

GEORGE CONDON, representative at Montreal for the National Steel Car Co., Ltd., spent the Ontario Jockey Club's spring race meeting week with Sir Donald Mann, at Fallingbrook, Toronto.

E. ARNOLD, Freight Claims Agent, G.T.R., Montreal, heretofore Second Vice President, Freight Claim Association, was elected First Vice President, at the recent convention at Galveston, Tex.

Miss Edith Shaughnessy, daughter of SIR THOMAS SHAUGHNESSY, was married at Montreal, June 3, to R. M. Redmond, of Montreal. They sailed from Montreal, June 5, for Europe.

E. S. MORRISON, Resident Engineer, and R. MORRISON, timekeeper, on construction,

C.N. Pacific Ry., at Blue River, B.C., were reported drowned in the Fraser River about 140 miles north of Kamloops, June 4.

J. A. M. AIKINS, K. C., M. P., who was knighted on the King's birthday, was, from the inception of the C.P.R., until his election as M.P. for Brandon, Man., Local Solicitor for the company at Winnipeg.

J. A. MURPHY, chief clerk to General Superintendent, Ontario Lines, G.T.R., Toronto, was married at Sarnia, Ont., recently to Miss M. Hickey. He was presented with a cabinet of silver and an address by his associates.

MORGAN BRANSBY WILLIAMS, who is said to have had more to do than any other man with the construction of the earlier railways in the British Isles, and who also built many of the Italian and Russian railways, died in England recently.

R. G. CHAMBERLIN, Chief of the Department of Investigation, C.P.R., Montreal, while on a visit to Vancouver, B.C., recently, was entertained to dinner by the police force of that city, where he was formerly Chief.

SAMUEL KING, of London, Ont., who formerly occupied important mechanical positions with the Canadian Pacific and Intercolonial Railways, and with the Canada Car Co., has been elected a director of the National Steel Car Co., Ltd., Hamilton, Ont.

H. E. WHITTENBERGER, General Superintendent, Ontario Lines, G.T.R., Toronto, who recently underwent an operation at the Wellesley Hospital, Toronto, is recuperating at his home, and expects to be able to return to duty during July.

M. D. CARDER, who died in Toronto recently, after being Grand Recorder, Ancient Order United Workmen of Ontario, for 35 years, was previously to that chief clerk in the Canada Southern Ry. Freight Department at St. Thomas, Ont.

H. S. HOLT, director, C.P.R., has resigned from the board of the Canadian Car and Foundry Co., on account of the large demands made on his time by the various companies with which he is connected, making it necessary for him to curtail his duties.

H. A. YOUNG, formerly Traffic Manager, Canadian Lake Line, and who last season was Assistant to Freight Traffic Manager, Richelieu and Ontario Navigation Co., has bought the business of Ontario Storage and Cartage Ltd., Toronto, and will devote his entire time to it.

E. F. KIFT and W. B. FLEMING, Toronto, have been appointed notaries public for five years, with jurisdiction in places which are not cities and towns of over 5,000 population, in matters relating to the Canadian Northern Ontario Ry., and to Mackenzie, Mann and Co., Ltd.

J. A. RICHARDSON, District Passenger Agent, Wabash Rd., Toronto, who broke his collar bone and sustained other injuries, at his home recently, is progressing favorably. He was at his office during the latter part of June, and expects to be fully recovered shortly.

E. G. JACKSON, Sales Manager, Canadian Car and Foundry Co., Ltd., Canadian Steel Foundries, Ltd., and Pratt and Letchworth, Ltd., Montreal, has resigned to go into business for himself. He is about to spend three months in Europe, and on his return will open an office in Montreal.

The will of the late WILLIAM WAINWRIGHT, Vice President, G.T.R. and G.T. Pacific Ry., directs his estate to be divided, half to the sons and half to the daughters,

subject to a few charitable bequests. The family residence in Montreal is to be maintained until the youngest comes of age.

In Canadian Railway and Marine World for April, under the heading of Birthdays of Transportation Men, the date of the birth of J. H. JOHNSTON, Superintendent of Bridges and Buildings, Eastern Lines, G.T.R., Montreal, was given as Apr. 22, 1860, instead of Apr. 22, 1866.

ALEXANDER STEWART, Assistant Chief Engineer, Great Northern Ry., Seattle, Wash., who died there, June 6, was chiefly concerned with the western lines, and supervised the work being carried out by the G.N.R. in the neighborhood of Vancouver, including the reclamation work at False Creek, and dock work at Burrard Inlet.

ROBERT SPROULE, who has been appointed Shop Foreman, C.P.R., Winnipeg, was born in County Tyrone, Ireland, Mar. 21, 1876, and entered railway service in 1898, since when he has been, to 1903, apprentice, Belfast and Northern Counties Ry. He came to Canada in 1903, and has since been engaged in general work, and as night foreman and day foreman, C.P.R., Fort William, Ont.

H. M. KERSEY, Manager in Chief of Ocean Services, C.P.R., London, Eng., has written to the committee of management of the training ship Conway, stationed in the Mersey, near Liverpool, offering 10 competitive scholarships for cadets, on condition that those holding them undertake to join the C.P.R. ocean service, either on leaving the Conway, or on completion of 12 months training as a reserve midshipman in the Royal Navy.

J. W. BLACK, of the Intercolonial Freight Department, Sydney, N.S., who retired from service at the end of May, entered I.R.C. service in 1882 as station master at Salt Springs, remaining there until he was transferred to the Freight Department at Sydney. During the time he was at Salt Springs he also acted as agent for the Western Union Telegraph Co. He left Sydney early in June for a trip to the Pacific coast.

W. J. PUGSLEY, of the C.P.R. Steamship Department, Montreal, who died at Ste. Agathe, Que., June 11, after a prolonged illness, was born in Jersey, Channel Islands, and came to Canada about 20 years ago, when he entered C.P.R. service. He was appointed Passenger Agent at Liverpool, Eng., about five years ago, and about the end of 1911 he was, on account of health, transferred to Montreal, and his previous position abolished.

X. H. CORNELL, who recently resigned as Superintendent of Transportation, Pere Marquette Rd., Detroit, Mich., on his appointment as Master of Transportation, Chicago and Alton Rd., Bloomington, Ill., was, from 1903 to Nov. 30, 1909, consecutively, Chief Dispatcher, Trainmaster and Master of Transportation, Western Division, G.T.R., Durand, Mich. He was subsequently Chief Supervisor, Michigan Car Demurrage Supervising Bureau, and Inspector of Transportation, Toledo, St. Louis and Western Rd., and Chicago and Alton Rd.

G. A. McCARTHY, who has been appointed Engineer of Railways and Bridges for the City of Toronto, graduated from McGill University in 1898, and for seven years prior to 1894 was engaged in the Intercolonial Ry. Engineering Department, Moncton, N.B. He was Principal Assistant Engineer, Canadian Niagara Power Co., Niagara Falls, Ont., 1901 to 1905; Chief Engineer, Timiskaming and Northern Ontario Ry., North Bay, Ont., 1905 to 1909, and from 1909 to 1913 was engaged in general engineering work, chiefly in heavy

concrete and steel construction, in western Canada and the western U.S.

E. H. FRITCH, Secretary, American Railway Engineering Association, Chicago, spent a few days in Toronto at the end of June, visiting his brother, L. C. Fritch, Assistant to President, Canadian Northern Railway.

CLAUDE LESLIE REEVE, whose appointment as chief clerk, Stores and Mechanical Accounts, C.P.R., Vancouver, B.C., was announced in our last issue, was born in Hampshire, Eng., Oct. 31, 1873, and entered C.P.R. service, July 20, 1905, since when he has been, to Aug. 14, 1905, car repairer; Aug. 15, 1905, to Jan. 24, 1906, invoice clerk; Jan. 25 to Oct. 27, 1906, time keeper; Oct. 28, 1906, to July 31, 1910, report clerk; Aug. 1, 1910, to May 1, 1914, head clerk and customs clerk, all at Vancouver, B.C.

A London, Eng., press dispatch states that the personal property left by the late LORD STRATHCONA amounted to \$23,257,010. The actual value has not been made public, but the duty paid, \$4,189,190, is stated to indicate that the total value was \$28,929,000. Some of the late Lord Strathcona's holdings in America were:—C.P.R., \$4,112,000; Bank of Montreal, \$645,000; Laurentian Co., \$466,000; Dominion Steel Corporation, \$400,000; Great Northern Ry., \$6,660,000; Northern Pacific Ry., \$3,380,000.

G. de W. ARCHIBALD, A.M. Can. Soc. C.E., who has been appointed City Engineer, Saskatoon, Sask., was recently engaged with Baldry, Yerburch and Hutchinson, contractors on section 2 of the Welland Ship Canal, St. Catharines, Ont. He commenced engineering in 1900 as rodman, draughtsman, etc., for the Nova Scotia Steel and Coal Co., later for the Dominion Iron and Steel Co., and was subsequently engaged in location and construction work, G.T. Pacific Ry., and from 1907 to 1912 was Engineer in Charge of Maintenance and Construction, Canadian Northern Ry.

FRANK LOUIS WILLIS, who was recently appointed Locomotive Foreman, C.P.R., McAdam Jct., N.B., was born at St. John, N.B., June 11, 1884, and was, from Feb., 1899, to July, 1903, apprentice, Phoenix Foundry, Marine and Locomotive Works, St. John, N.B.; July 14, 1903, to Apr. 10, 1904, third engineer, s.s. Louisburg, Black Diamond Steamship Co., sailing out of Sydney, N.S.; Mar. 18, 1904, to Dec. 1, 1903, machinist, C.P.R., McAdam Jct., N.B.; Jan. 1, 1909, to Jan. 1, 1911, charge hand, C.P.R., McAdam Jct.; Jan. 1, 1911, to Apr. 1, 1914, Assistant Foreman, C.P.R., McAdam Jct.

HENRY K. YORK, whose appointment as Car Foreman, C.P.R., Transcona, Man., was announced in our last issue, was born at Victoria Corner, Carleton County, N.B., Mar. 20, 1881, and entered C.P.R. service Dec. 3, 1903, since when he has been, to June 30, 1904, car repairing, Fort William, Ont.; June 30, 1904, to Feb. 28, 1905, air brake tester, Fort William, Ont.; Feb. 28, 1905, to May 20, 1906, Car Inspector, Fort William, Ont.; May 20, 1906, to May 1, 1908, Assistant Car Foreman, Fort William, Ont.; May 1, 1908, to July 1, 1910, Car Foreman, Ignace, Ont.; July 1, 1910, to Apr. 27, 1914, Car Foreman, Kenora, Ont.

ERNEST BOWER, who has been appointed Travelling Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., was born at Nottingham, England, Jan. 17, 1889, and entered transportation service in Apr., 1907, since when he has been, to Apr., 1910, consecutively, stenographer, baggage master and ticket clerk, Canadian Northern Ry., North Battleford, Sask.; Apr., 1910, to Dec. 1, 1912, chief clerk and Travelling Passenger Agent, Canadian Northern Steamships, Ltd., Winnipeg; Dec. 1, 1912, to Jan. 15, 1913 (during which time the

C.N.S. Winnipeg office was closed), ticket stock clerk, C.N.R., Winnipeg; Sept. 30, 1913, to May 15, 1914, ticket agent, Union Station, Edmonton, Alta.

The will of the late SIR WILLIAM WHYTE has been probated at \$587,199, the chief beneficiary being Lady Whyte. In addition to receiving the major portion of the estate, she gets \$31,000 insurance, which, it is stated, is not to be considered as part of the estate. She receives approximately \$175,000, to be derived from the sale of Winnipeg Electric Ry. stock, which is to be invested for her benefit, and on her decease to be divided into six equal shares, one share to go to each of four daughters, and the remaining two shares to the son. Other amounts bequeathed are:—\$5,000 to a sister, \$3,000 and \$10,000 to two brothers respectively, \$1,000 to Winnipeg General Hospital, \$1,000 to Manitoba College, and \$2,000 to Rev. Dr. DuVal, Winnipeg, Sir William's pastor.

CLAIR MALCOLM, who has been appointed chief clerk, Auditor of Stores and Mechanical Accounts, Alberta Division, C.P.R., Calgary, was born at Tatamagouche, N.S., Oct. 18, 1881, and entered C.P.R. service in the Stores Department, May 1, 1899, since when he has been, to Dec. 1900, clerk and storeman, Vancouver, B.C.; Dec. 1900 to May 1901, storekeeper, Smelter Jct. B.C.; May 1901 to Jan. 1905, clerk, Vancouver, B.C.; Jan. 1905 to Feb. 1906, chief clerk, Calgary, Alta.; Feb. to Dec. 1906, Assistant Inspector, Auditor of Stores and Mechanical Accounts, Western Lines, Winnipeg; Dec. 1906 to Dec. 1908, Assistant Inspector, Auditor of Stores and Mechanical Accounts, Eastern Lines, Angus Shops, Montreal; Dec. 1908 to Apr. 1914, clerk, same department, Angus Shops, Montreal.

CORNELIUS E. LEGG, whose appointment as Trainmaster, Winnipeg Terminals, C.P.R., was announced in our last issue, was born in Illinois, Nov. 15, 1864, and entered railway service in 1882, since when he has been, to 1886, telegraph operator, Chicago, Rock Island and Pacific Ry., at various places in Iowa; 1886 to 1889, agent, Chicago Great Western Ry., at various places in Iowa; 1889 to 1891, brakeman, same road; 1891 to 1897, freight conductor, same road, Des Moines, Ia.; 1897 to 1899, passenger conductor, same road; 1899 to 1900, Yardmaster, same road, Leavenworth, Kan.; 1900 to 1912, freight conductor, passenger conductor, agent and Yardmaster, consecutively, Great Northern Ry., at various places in Washington and British Columbia; 1912 to May 1914, General Agent, C.P.R., Fort William, Ont.

STEPHEN REED PAYNE, who has been appointed General Manager, Ottawa and New York Ry., and Manager, Ottawa Division, New York Central and Hudson River Rd., Ottawa, Ont., was born Dec. 21, 1865, and entered railway service Nov. 2, 1882, since when he has been, to Aug. 25, 1889, telegraph operator, Lake Shore and Michigan Southern Ry.; Aug. 25, 1889, to Jan. 15, 1898, dispatcher, same road; Jan. 15, 1898, to Apr. 1, 1900, Trainmaster, same road; May 13, 1900, to Jan., 1903, Trainmaster, and Assistant Division Superintendent, Norfolk and Western Ry., Bluefield, West Virginia; Jan., 1903, to 1907, Trainmaster, New York Central Lines, Utica, N.Y.; 1907 to 1908, Assistant Superintendent, Western Division, New York Central Lines, Syracuse, N.Y.; 1908 to Oct., 1913, Superintendent, Buffalo Division, same road, and General Superintendent, Western Division, same road, Syracuse, N.Y.; Oct., 1913, to June, 1914, Assistant to General Manager, same road, Rochester, N.Y.

DAVID CROMBIE, who has been appointed Inspector of Transportation, Canadian

Northern Ry., Toronto, was born at Hamilton, Ont., May 13, 1864, and entered railway service in June 1882, since when he has been, to 1887, telegraph operator, G.T. R.; 1887 to 1889, ticket agent, same road, Chatham, Ont.; 1889 to 1890, dispatcher, same road, London, Ont.; 1890 to 1892, dispatcher, Flint and Pere Marquette Rd., Saginaw, Mich.; 1892 to 1894, car distributor, same road; 1894 to Jan. 1, 1900, Superintendent of Car Service, same road; Jan. 1 to July 1900, Superintendent of Car Service, Pere Marquette Rd., Detroit, Mich.; July 1900 to 1903, Superintendent of Transportation, same road; 1903 to Feb. 1907, in private business; Feb. to Oct. 1907, Master of Transportation, Middle Division, G.T.R., London, Ont.; Oct. 1907 to Nov. 22, 1910, Assistant to General Transportation Manager, same road, Montreal; Nov. 22, 1910 to Jan. 14, 1913, Assistant to Vice President, Transportation, Maintenance and Construction, same road, Montreal; Jan. 14 to Aug. 1, 1913, General Superintendent of Transportation, same road, Montreal; Aug. 1913 to May 1914, Inspector of Transportation, Pere Marquette Rd., Detroit, Mich.

H. N. RUTTAN, M. Can. Soc. C.E., who recently retired as City Engineer, Winnipeg, after nearly 30 years service, has had considerable railway experience. He entered G.T.R. service in 1866, on the engineering staff, and three years later transferred to the Intercolonial Ry., and in 1872-73, was in charge of the engineering and construction of 50 miles of that line along the Baie des Chaleurs. He transferred to the Dominion Government's service in connection with the C.P.R. in 1874, and made some of the first surveys for that line along the north shore of Lake Superior, and in the following year was in charge of a survey party to select a line for the C.P.R. between Edmonton, Alta., and the Yellowhead Pass. He was engaged on this for nearly two years, and located the line now generally followed by the Canadian Northern and Grand Trunk Pacific Rys. From 1877 to 1880 he was in charge of the engineering work between Winnipeg and Kenora (then Rat Portage), and in the latter year he commenced private practice in Winnipeg. He was appointed City Engineer, Winnipeg, in 1886, and has now been retained as Consulting Engineer. He has a retiring allowance from the city of \$5,000 a year.

JAMES KERR McNEILLIE, who has been appointed Superintendent, District 3, Eastern Division, C.P.R., Montreal, was born at Toronto, Feb. 23, 1874, and entered railway service in May, 1890, since when he has been, to Nov., 1891, call boy and apprentice, G.T.R., Lindsay, Ont.; Nov., 1891, to Sept. 1896, apprentice, locomotive fitter and machinist, G.T.R., Point St. Charles, Que.; Sept. 1, 1896, to Nov., 1899, trainmaster's clerk and chief clerk, Superintendent's office, C.P.R., Farnham, Que.; Nov., 1899, to June, 1902, clerk, and chief clerk, General Superintendent's office, C.P.R., Winnipeg; June, 1902, to Feb., 1903, Car Service Agent, C.P.R., Winnipeg; Mar., 1903, to Oct., 1907, Car Service Agent in charge of distribution of passenger equipment, C.P.R., Montreal; Oct., 1907, to July, 1908, Assistant Superintendent of Terminals, C.P.R., Toronto; July, 1908, to Feb., 1909, Superintendent, District 1, Ontario Division, C.P.R., Toronto; Feb., 1909, to Mar., 1911, Superintendent, District 2, Ontario Division, C.P.R., London; Mar., 1911, to Feb., 1913, Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que.; Feb., 1913, to June, 1914, Superintendent, District 2 (Montreal Terminals), Eastern Division, C.P.R., Montreal.

M. M. REYNOLDS, Vice President, G.T.R. and G.T. Pacific Ry., who died at Old Point

Comfort, Va., June 17, had been suffering from Bright's Disease for some time, and his condition became somewhat acute early in the spring, and he left for the south about two months ago. He was born at Syracuse, N.Y., in 1859, and was educated there. He entered railway service with the National Railways of Mexico, where he remained for about 11 years, during the latter part of which he was Auditor. In Jan., 1892, he was appointed General Auditor, Central Vermont Ry., and from 1896 to 1899 acted as Auditor for the receivers of that road, and on the termination of the receivership was reappointed Auditor for the company. In 1902 he was appointed Comptroller, National Railways of Mexico. During 1904 he was also appointed Comptroller, Mexican International Ry., and Inter-oceanic Ry. of Mexico. He was appointed Fifth Vice President, G.T.R., in charge of the audit department in 1908; in 1910, Fourth Vice President; in 1911, Third Vice President, in charge of the financial department, and on the abolition of the numerical designations of the Vice Presidents, he was appointed Vice President, G.T.R., in charge of the financial department, and also Vice President and a director of the G.T. Pacific Ry.

HENRY W. GAYS, General Manager, Ottawa and New York Ry., Ottawa, who died there, May 31, after an illness of about four months, was born at Brant, Erie County, N.Y., Mar. 21, 1848. He entered railway service Jan. 1, 1861, since when he was, to Dec. 31, 1862, messenger, Erie Rd., Dunkirk, N.Y.; Jan. 1, 1863, to Mar. 31, 1864, telegraph operator, same road, Dunkirk, N.Y.; Apr. 1, 1864, to Mar. 18, 1867, assistant cashier, Buffalo and Erie Ry., Dunkirk, N.Y.; Oct. 1, 1867, to July 31, 1869, cashier, same road, Dunkirk, N.Y.; Aug. 1, 1869, to June 30, 1874, cashier, Louisville and Cincinnati Mail Line Steamers; July 1, 1874, to May 30, 1877, General Agent, same company; June 1, 1877, to Mar. 31, 1879, General Agent, Cleveland, Columbus, Cincinnati and Indianapolis Ry.; Apr. 1, 1879, to Mar. 30, 1885, Assistant General Freight Agent, same road; Jan. 1, 1881, to Apr. 30, 1885, also General Freight Agent, Indianapolis and St. Louis Ry.; July 1 to Oct. 31, 1885, in charge of traffic, Wiggins Ferry Co. and East St. Louis Connecting Ry.; and operated lines at St. Louis, Mo.; Nov. 1, 1885, to May 30, 1886, Superintendent, same companies; June 1, 1886, to Nov. 30, 1889, Manager, same companies; Dec. 1, 1889, to Aug. 1, 1894, General Manager, St. Louis Merchants Bridge and Terminal Ry.; Aug. 1, 1894, to July, 1896, Traffic Manager, St. Louis, Chicago and St. Paul Ry.; July, 1896, to Feb., 1899, General Manager, same road, and Chicago, Peoria and St. Louis Ry.; Feb., 1899, to Apr. 25, 1900, General Manager, New York and Ottawa Rd.; Nov., 1899, to Apr. 25, 1900, also President, and Apr. 25, 1900, appointed Receiver, same road; Mar. 1, 1899, appointed Manager, Ottawa and New York Ry., and Nov., 1899, also President and Receiver, same road, which positions he retained until the New York and Ottawa Rd., which owned the Ottawa and New York Ry., was sold by order of the U. S. Courts, in 1904, to the New York Central and Hudson River Rd., when he was appointed General Manager.

C. P. R. Contracts for Boarding.—The C. P. R. has entered into a contract, we are officially advised, with the Consolidated Boarding and Supply Co., Montreal, for boarding its employes on second track work on the Lake Superior Division. This was formerly done by the Harris Abattoir Co., Toronto.

Railway Finance, Meetings, Etc.

Pere Marquette Rd.—S. A. Felton, Chicago, Ill., resigned as a member of the Board of Receivers, June 4, and the U. S. District Court, sitting at Detroit, Mich., appointed P. H. King, Grand Rapids, Mich., as his successor.

Quebec and Saguenay Ry.—In connection with a report to the effect that the Government would guarantee Q. & S. R. bonds, the Premier stated in the House of Commons, June 1, that there was no legislation in regard to the company in the Government's sessional programme, and that the Governor in council had no power to guarantee bonds.

Toronto, Hamilton and Buffalo Ry.—The following directors have been elected for the current year,—H. B. Ledyard, D. McNicoll, W. H. Newman, Sir Edmund Osler, D. W. Saunders, W. L. Scott, Sir Thomas Shaughnessy, A. H. Smith, W. P. Torrance and W. K. Vanderbilt, Jr.

Temiscouata Ry.—Net earnings for March, \$6,472, and for nine months ended Mar. 31, \$35,132.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Apr. 21, \$83,404, against \$124,961 for same period 1913.

Railway Route Maps Approved.

The Minister of Railways and Canals has approved route maps of railways, as follows:—

Toronto Terminals Ry., through Toronto, about 4 miles, May 7.

Canadian Northern Ry., from Grand Marais to Victoria Beach, Man., 14.16 miles, May 7.

Kettle Valley Ry., branch from near Summers Creek, mileage 65.2, via Princeton, to Copper Mountain, 28 miles; and from mileage 60, near Five Mile Creek, to junction with Vancouver, Victoria and Eastern Ry. (G.N.R.), near Princeton, about 13 miles, May 20.

Calgary and Fernie Ry., from Kananaskis Pass to junction with Western Dominion Ry. in Tp. 20, R. 2, w. 5 m., about 48 miles, with running rights over the Western Dominion Ry. from that junction to Calgary, May 20.

Edmonton, Dunvegan and British Columbia Ry., revised location from Tp. 74, R. 18, to Tp. 78, R. 23, w. 5 m., about 45 miles, with the understanding that a branch is to be built to Grouard, Alta., May 20.

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

	Acres.
Calgary and Edmonton Ry.	1,451.31
Canadian Northern Ry.	770.82
Canadian Pacific Ry.	6.38
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	4,003.00
Total	6,231.51

U. S. Government Railway in Alaska.—Surveys for the building of a Government railway in Alaska are reported to have been started by a party of engineers in charge of H. Yeyo at Chitina, on the Copper River and Northwestern Rd.

Two lighters, for use of the Department of Railways and Canals, in connection with the work at Port Nelson, on Hudson Bay, were launched by Polson Iron Works, Toronto, May 30. These vessels are 123 ft. long, 21½ ft. wide and 10 ft. deep, and full description has already appeared in Canadian Railway and Marine World. They will proceed to Port Nelson under their own steam, and will carry cargo.

Steam Railways Built Without Dominion Subsidies.

Senator Lougheed replying to questions in the Senate recently, said that during the last 15 years the C. P. R. directly, or through its subsidiary companies, had built 5,033 miles of railway, of which 2,825 had been built in the seven years ended Dec. 31, 1913. These 2,825 miles were built in the several provinces as follows:—Saskatchewan, 1,260; Ontario, 608; Alberta, 478; Manitoba, 154; British Columbia, 125; Quebec, 124; New Brunswick, 80.

The following lines were built by different companies, without any aid from the Dominion Government. The figures give the respective mileages.

BRITISH COLUMBIA:—Bedlington and Nelson, 12.04; British Yukon, 31.2; Crow's Nest-Southern, 74.18; Eastern British Columbia, 16; Kaslo and Slocan 23.37; Morrissey, Fernie and Michel, 5.82; Nelson and Fort Sheppard, 55.42; New Westminster Southern, 23.73; Red Mountain, 9.59; Vancouver, Victoria and Eastern, 236.08; Victoria and Sydney, 16.96; Wellington Colliery Co.'s, 10.75.

QUEBEC:—Carleton and Grenville, 13; Montreal and Atlantic, 163.40; Montreal and Vermont Jct., 23.60; Rutland and Noyan, 3.39; Stanstead, Shefford and Chambly, 43.

MANITOBA:—Brandon, Saskatchewan and Hudson Bay, 69.45; Manitoba and Great Northern, 91.77; Midland of Manitoba, 6.40.

YUKON:—British Yukon, 69.90.

ONTARIO:—London and Port Stanley, 23.66.

NEW BRUNSWICK:—Maine Central, 5.10.

Total, 1,027.83 miles. The form in which the question was put was, "Did any other railway company, (i. e., other than the C. P. R., which built the 5,033 miles since 1899) build any railway without subsidy from the Government?" and the answer was that the lines above mentioned were so built, the inference being that the 5,033 miles of C. P. R. lines built since 1899 were built without subsidy.

New C.P.R. Service, Montreal to Chicago.

—Starting May 31, the C.P.R. increased its service between Montreal and Chicago by the addition of two trains, to be known as the Canadian. The westbound train leaves Montreal daily at 8.45 a.m., reaching Toronto at 5.40 p.m., leaving at 6.10, and reaching Detroit at 11.35 p.m., and Chicago 7.45 on the following morning. The eastbound train leaves Chicago daily at 9.30 a.m., reaching Toronto at 11.20 p.m., and Montreal at 9 the following morning. The equipment will comprise standard passenger cars, dining cars, sleeping cars and compartment observation cars. This service has been arranged in conjunction with the Michigan Central Rd., that company's tunnel and line being used from Windsor, Ont., to Chicago. The ordinary service between Detroit and Chicago, via the Wabash Rd., is being continued.

The C. P. R. Has Secured an interim injunction restraining the Ce Pea R. Oil Co., Calgary, Alta., from printing or publishing its corporate name in such a way as to mislead or to induce the public to believe that the C. P. R. is in any way interested in the Company. In all the advertising matter issued the letters C. P. R. in the company's name are in capitals.

J. A. Falardeau, Agent, G.T.R., Doucets Landing, Que., writes: "Enclosed is \$2 for the current year's subscription. I value very much every issue of Canadian Railway and Marine World, and beg to say that every railway agent should have it, as it keeps a man posted on what is going on in railway business."

Railway Rolling Stock Notes.

The Intercolonial Ry. has ordered 4 pit cars, 75 tons capacity, from Eastern Car Co.

F. H. Hopkins and Co. have ordered 1 thirty ton Lidgerwood unloader from Canadian Car and Foundry Co.

The Quebec Harbor Commissioners have ordered 2 flat cars, 40 tons capacity, from Canadian Car and Foundry Co.

The Intercolonial Ry. is reported to have placed an order for box cars with the Eastern Car Co.

The Canadian Northern Ry., between May 15 and June 14, received 3 consolidation locomotives from Canadian-Allis-Chalmers, Ltd.

The estimates for the current year, voted by the Dominion Parliament, include \$1,520,000 for additional rolling stock for the Canadian Government Railways.

The Intercolonial Ry. has received the following additions to rolling stock:—55 box cars, 60,000 lbs. capacity, 6 box cars, 80,000 lbs. capacity, from Canadian Car and Foundry Co.; and 112 box cars, 80,000 lbs. capacity, from Nova Scotia Car Works.

The C.P.R., between May 15 and June 15, ordered the following rolling stock from its Angus Shops:—1 steel baggage and express car, 7 vans, 104 steel frame box cars, 6 steel flat cars, 1 freight refrigerator car and 5 class U3 locomotives.

The C.P.R. between May 15 and June 15, received the following additions to rolling stock:—137 steel frame box cars, 5 steel colonist cars and 1 class G2 locomotive from its Angus Shops, and 25 steel frame box cars from Canadian Car and Foundry Co.

In Canadian Railway and Marine World for June, mention was made of an order having been placed by the Intercolonial Ry., for 180 steel underframe box cars, with the Eastern Car Co. This order was placed in February, and was mentioned in our March issue.

Following are the chief details of the 12 Otis all steel ore cars, which the Mond Nickel Co. has ordered from the Hart-Otis Car Co., and which will be built by Canadian Car and Foundry Co., as mentioned in our last issue:—

Capacity 100,000 lbs.
Length over end sills 21 ft. 0 1/4 in.
Length inside 19 ft.
Width over all 9 ft. 11 1/4 ins.
Width inside 9 ft. 6 ins.
Height inside 4 ft. 6 ins.
Height from rail 8 ft. 10 3-16 ins.
Doors on each side 4

The Canadian Car and Foundry Co., during May, delivered rolling stock, completing original orders, which were as follows:—Montreal Harbor Commissioners, 15 all steel Otis cars, 50 tons capacity; C.P.R., 40 all steel Otis cars, 50 tons capacity, 6,000 steel frame box cars, 40 tons capacity; J. D. McArthur Co., 70 wood ballast cars, 40 tons capacity, F. H. Hopkins and Co., 2 Lidgerwood unloaders, 30 tons capacity; Montreal Tramways Co., 100 street car bodies and 125 pairs of trucks; Canadian Northern Ry., 10 wood colonist cars; and Intercolonial Ry., 500 steel frame box cars 30 tons capacity.

The Hudson's Bay Construction Co., Pas, Man., has received from the Hart-Otis Car Co., 70 of the latest type of Hart convertible ballast and construction cars, built by Canadian Car and Foundry Co. Following are the chief details:—

Length over end sills 36 ft. 8 ins.
Width over side sills 8 ft. 10 ins.
Length inside as hoppers 20 ft. 10 ins.
Length inside as gondolas 34 ft. 8 ins.
Width inside 8 ft. 8 ins.

Width over all 10 ft. 2 1/2 ins.
Width at top 9 ft. 10 ins.
Height from rail to floor 4 ft. 4 1/2 ins.
Height from rail to top of car 8 ft. 1 3/4 ins.
Height inside 3 ft. 9 1/4 ins.
Truck centres 26 ft. 8 ins.
Wheel base of truck 5 ft. 4 ins.
Length of hopper door opening 16 ft. 8 1/2 ins.
Width of hopper door opening 2 ft.

Following are chief details of the six wheeled saddle tank locomotive, built for burning oil fuel, which the Robt. McNair Shingle Co., Vancouver, B.C., has received from Canadian Locomotive Co.:—

Weight in working order 70,255 lbs.
Wheel base 8 ft.
Driving wheels, diar. 36 ins.
Driving wheel centres Cast iron
Driving journals 6 by 8 ins.
Cylinders, diar. and stroke 13 1/2 by 18 ins.
Boiler, type Straight top, radial stay
Boiler pressure 170 lbs.
Tubes, no. and diar. 103—2 ins.
Tubes, length 10 ft.
Injectors Ontario
Safety valves Locomotive type
Brakes Westinghouse automatic
Packing Metallic
Capacity, water 1,500 U.S. galls.
Capacity, oil 300 U.S. galls.

Following are chief details of the six wheeled saddle tank locomotive which the Asbestos and Asbestic Co., Asbestos, Que. has received from the Canadian Locomotive Co.:—

Weight in working order 59,800 lbs.
Wheel base 8 ft.
Driving wheels, diar. 33 ins.
Driving wheel centres Cast iron
Driving journals 6 by 8 ins.
Cylinders, diar. and stroke 13 by 16 ins.
Boiler, type Straight top, radial stay
Boiler pressure 160 lbs.
Tubes, no. and diar. 103—2 ins.
Tubes, length 9 ft. 2 ins.
Injectors Ontario
Safety valves Locomotive type
Brakes Westinghouse automatic
Packing Metallic
Capacity, water 700 imp. galls.
Capacity, coal 1,000 lbs.

Baldry, Yerburch and Hutchinson, contractors for Sec. 2, Welland Ship Canal, St. Catharines, Ont., have ordered two six wheeled, saddle tank locomotives, from Canadian Locomotive Co., similar to one previously ordered, but with tenders applied. Following are chief details:—

Weight in working order 91,100 lbs.
Wheel base 9 ft. 6 ins.
Driving wheels, diar. 42 ins.
Driving wheel centres Cast iron
Driving journals 6 1/2 by 8 ins.
Cylinders, diar. and stroke 15 by 22 ins.
Boiler, type Straight top, radial stay
Boiler pressure 180 lbs.
Tubes, no. and diar. 138—2 ins.
Tubes, length 10 ft.
Injectors Ontario
Safety valves Locomotive type
Brakes Westinghouse automatic
Packing Metallic
Capacity, water 1,500 imp. galls.
Capacity, coal 3,000 lbs.

Following are details of the consolidation locomotives which the intercolonial Ry. received recently from Canadian Locomotive Co., as mentioned in our last issue:—

Weight on drivers 208,000 lbs.
Weight, total 236,000 lbs.
Wheel base, engine, rigid 16 ft. 6 ins.
Wheel base, engine, total 25 ft. 5 ins.
Wheel base, engine and tender 69 ft. 11 ins.
Heating surface, firebox 207 sq. ft.
Heating surface, tubes 1,885 sq. ft.
Heating surface, total 2,092 sq. ft.
Driving wheels, diar. 63 ins.
Driving wheel centres Cast steel
Driving journals 10 by 14 ins.
Cylinders, diar. and stroke 24 by 32 ins.
Boiler, type Straight top, radial stay
Boiler pressure 180 lbs.
Tubes, no. and diar. 227—2 ins.

Tubes, length 15 ft. 2 3/4 ins.
Injectors and safety valves Locomotive type
Brakes Westinghouse American
Packing Metallic
Superheater Schmidt A
Valve gear Walschaert
Weight of tender, loaded 140,000 lbs.
Tank, type Water bottom
Truck, type Outside equalized
Wheels, diar. 34 ins.
Wheels, type Steel tired, w.i. centres

Journals 5 1/2 by 10 ins.
Brake beams Steel I section
Capacity, water 6,500 imp. galls.
Capacity, coal 10 tons

Following are chief details of the seven mogul locomotives which J. D. McArthur Co., railway contractors, have received from the Canadian Locomotive Co. Six for Hudson Bay Ry. construction, and one for the Edmonton, Dunvegan and British Columbia Ry.:—

Weight on drivers 112,800 lbs.
Weight, total 129,500 lbs.
Wheel base of engine, rigid 12 ft. 6 ins.
Wheel base of engine, total 20 ft. 6 1/2 ins.
Wheel base of engine and tender 49 ft. 3 3/4 ins.
Heating surface, firebox 133 sq. ft.
Heating surface, tubes 1,301 sq. ft.
Heating surface, total 1,434 sq. ft.
Driving wheels, diar. 50 ins.
Driving wheel centres Cast iron
Driving journals 8 1/2 by 12 ins.
Cylinders, diar. and stroke 19 by 26 ins.
Boiler, type Extended wagon top
Boiler pressure 180 lbs.
Tubes, no. and diar. 240—2 ins.
Tubes, length 10 ft. 5 1/4 ins.
Injectors Two, locomotive type
Safety valves Two, 3 ins.
Brakes Westinghouse
Packing Metallic
Weight of tender, loaded 115,400 lbs.
Tank, type U shape
Truck, type 4 wheel, arch bar
Wheels, diar. 33 ins.
Wheels, type Steel tired
Journals 5 by 9 ins.
Brake beam Steel
Capacity, water 5,000 imp. galls.
Capacity, coal 9 tons

Since the passing of the guarantee bill by the Dominion Parliament, the Canadian Northern management, which has not placed any rolling stock orders for some time past, has been considering what its requirements will be. About the middle of June D. B. Hanna, Third Vice President, summoned A. L. Graburn, Mechanical Engineer, back from Atlantic City, where he was attending the mechanical convention, and also brought S. J. Hungerford Superintendent of Rolling Stock, from Winnipeg for consultation. The new Ottawa-Toronto line, on which a freight and a day passenger service is now being operated will be opened for through fast service to Ottawa before next session of Parliament and the line from north of Sudbury west to Port Arthur will also be put in operation for through service, to give direct connection to Edmonton and beyond. Plans and specifications are being prepared for a large amount of equipment, including passenger, parlor, cafe parlor, dining and sleeping cars, and it is possible that all steel construction will be decided on. Canadian Railway and Marine World is officially advised that when the orders are placed they will be for the last word in the way of passenger equipment.

Gradients on Grand Trunk Pacific Ry.—

We have been furnished with the following official information:—The G.T.P.R. maximum gradient westbound is 0.5%; eastbound, 0.4%. There is on the Mountain Division 20.15 miles of 1% pusher grade against eastbound traffic, this occurring between miles 30 and 50, west of Yellowhead Pass. As this 1% is distinctly a pusher proposition and is planned for such, this company's maximum gradients are 0.5% against westbound and 0.4% against eastbound traffic. The maximum gradient both east and west from Wainwright to the Pacific Coast is 0.4%, with, of course, the 20 miles of pusher grade above referred to. Between Winnipeg and Wainwright the westbound gradient is 0.5% and 0.4% eastbound.

Curtis's & Harvey (Canada), Ltd., manufacturers of dynamite and other high explosives, Montreal, write: "Canadian Railway and Marine World is, without doubt, one of the best edited and printed papers in the country."

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 fyled our paper have a continuous record of the Board's proceedings. No other paper has done this.

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

21730. Apl. 29.—Authorizing C.N. Ontario Ry. to cross Silverthorne Ave., Toronto, by structure carrying highway over railway.

21731. May 1.—Authorizing G.T. Pacific Ry. to build ladder tracks across Kinstino Ave., Edmonton, Alta., and approving freight station there.

21732. May 1.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional right of way for transmission line in St. Ignace du Coteau du Lac Parish, Que.

21733. May 2.—Amending order 21480, Mar. 13, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) spur across C.N. Ontario Ry., at Trenton, Ont.

21734. May 2.—Ordering Great North Western Telegraph Co. to remove its wires and poles from Kent and certain other streets in Lindsay, Ont., and apportioning payment of cost of work.

21735. May 1.—Ordering Canadian Northern Ry. to erect fences along right of way on its Ottawa-Capreol Line through Field, Crerar, Badgerow and Gibbons Tps., Ont., within 60 days from date.

21736. May 1.—Authorizing C.P.R. to build spur for National Cash Register Co., York Tp., Ont.

21737. May 2.—Authorizing G.T.P. Branch Lines Co. to carry traffic over portion of its Young-Prince Albert Branch, Sask., between mileage 67 at Wakaw and mileage 87, speed of trains limited to 15 miles an hour.

21738. May 2.—Authorizing C.P.R. to rebuild bridge 5.3 near Priceville Station, Ont.

21739. May 2.—Authorizing Canadian Northern Ry. and C.P.R. to operate trains over crossing in Sec. 35-24-27, w. 4 m., Alta., without first stopping.

21740. May 4.—Amending order 21481, Mar. 13, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) spur across C.N. Ontario Ry., at Trenton, Ont.

21741. May 2.—Approving Lake Erie and Northern Ry.'s plan of overhead bridge at highway crossing between Cons. 2 and 3, Brantford Tp., Ont., mileage 16.92.

21742. May 2.—Authorizing Toronto, Hamilton and Buffalo Ry. and Hamilton St. Ry. to operate over crossing on Barton St., Hamilton, without first stopping.

21743. Apl. 20.—Approving Bell Telephone Co.'s agreement with Brighton Tp., Ont., of Mar. 31, for interchange of service.

21744. May 2.—Authorizing G.T. Pacific Ry. to build across and divert highway in Lot 935, Cariboo Dist., B.C., mileage 232.3, Yellowhead Pass west.

21745. May 2.—Ordering that classification of maple butter be made the same as peanut butter, the change to be included in Supplement 3 to Canadian Freight Classification 16.

21746. May 4.—Disallowing supplement 146 to G.T.R. Special Tariff, C.R.C. no. E-2552, increasing rate on clay, in carloads, from Waterdown to Swansea and Mimico, Ont., from 1½¢ to 2¢ per 100 lbs., and restoring rate of 1½¢ per 100 lbs.

21747. May 4.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional land for right of way for transmission line, St. Joseph de Soulanges Parish, Que.

21748. May 2.—Authorizing Osborne rural municipality, no. 310, Sask., to build crossing over C.P.R. Pheasant Hills Branch at west boundary of s.e. ¼ sec. 34-33-23, w. 2 m., Sask., and rescinding order 21452, Mar. 9, 1914, in same connection.

21749. Apl. 27.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional 24.8 ft. for transmission line across east half, Lot 31, Con. 1, Lancaster Tp., Ont.

21750. May 1.—Appointing P. H. Drayton, K.C., as arbitrator to enquire into damages, if any, sustained by Heward Estate in connection with C.P.R. spur in Toronto, and fix compensation therefor.

21751. Apl. 29.—Ordering C.P.R. and Ottawa and New York Ry., by June 1, to schedule trains 30 and 305, C.P.R., and 20, O. & N.Y.R., at Finch, Ont., at 9:52 a.m., and carry out certain directions and rescinding order 19625, May 13, 1913, in same connection.

21752. May 2.—Authorizing clearances as shown on C.P.R. plan re Rogers Pass Tunnell.

21753. May 2.—Relieving G.T.R. from providing further protection at crossing of first highway west of Stoney Creek, Ont.

21754. May 4.—Approving revised location

G.T. Pacific Branch Lines Co., Moose Jaw Northwest Branch from mileage 73.34 to 77.98, Sask.

21755. May 4.—Authorizing C.P.R. to build bridge 18.1, Moose Jaw Subdivision, Sask.

21756. May 4.—Authorizing C.P.R. to divert old trail to Medicine Hat and build its Swift Current Northerly Branch across same in Sec. 36-22-29, w. 3 m., Sask.

21757. May 4.—Ordering C.P.R. within 90 days to install improved type of automatic bell at crossing of first highway east of Central Ontario Jct., 20% of cost to be paid out of the railway grade crossing fund.

21758. May 6.—Approving revised location of C.P.R. Swift Current Northwestern Branch from mileage 0, northwesterly to mileage 10.82.

21759. May 5.—Authorizing C.P.R. to build siding, at grade, across public road between City of Guelph and Guelph Tp., at mileage 30.33, Hamilton and Goderich Subdivision, Ont.

21760. May 6.—Authorizing Dominion Atlantic Ry. to rebuild bridge over Bear River, Digby County, N.S., and approving plan B-1-1261, marked A, showing location of proposed temporary lift span in old bridge.

21761. May 5.—Authorizing C.P.R. to build spur for Builders' Supply Co., Winnipeg, Man.

21762. May 5.—Authorizing C.P.R. to take certain lands in Ottawa, Ont., for enlarging its Sussex St. terminals.

21763. May 6.—Authorizing C.P.R. to change location of spur for Security Lumber Co., Moose Jaw, Sask.

21764. May 5.—Approving location and details of C.N. Quebec Ry. station at Lac aux Sables.

21765. May 6.—Approving Supplement 4 to Express Classification for Canada, 3, containing changes respecting moving picture films, organs, pianos and pianoplayers.

21766. May 6.—Authorizing Toronto, Hamilton and Buffalo Ry. to divert highway between Lots 21 and 22, Con. 5, Gainsboro Tp., Ont., and authorizing it to acquire a 66 ft. parcel of land connecting that highway with highway between Cons. 5 and 6, and to convey to Gainsboro Tp. said land for highway purposes, in lieu of another parcel.

21767. May 5.—Authorizing Toronto, Hamilton and Buffalo Ry. to install automatic block signals between Welland and Hamilton, Ont.; approving plans of said signals, and rescinding orders 14066 and 15974, June 24th, 1911, and Feb. 14th, 1912, respectively.

21768. May 6.—Authorizing C.P.R. to build spur for Pilkington Bros., Calgary, Alta.

21769. May 6.—Authorizing C.P.R. to open for traffic its double track from mileage 109.4 to 110.5, Swift Current Subdivision, Sask.

21770. May 6.—Authorizing C.P.R. to take certain lands in Peterboro, Ont., for providing team road to its freight yard.

21771. May 6.—Authorizing C.P.R. to build extension to siding for William Neilson, Ltd., in Beachville, Ont.

21772. May 7.—Authorizing C.P.R. to open for traffic portions of double track on its Bergen Northerly Line, from mileage 0 to 9.32; Emerson Subdivision, mileage 0 to 2.03; and Lac du Bonnet Subdivision, from Whittier to Murdoch, mileage 65.1 to 62.2, Man.

21773. May 6.—Authorizing C.P.R. to build spur for F. Sask. & Co. and The Constructors, Ltd., Regina, Sask.

21774. May 7.—Approving plan X-2-317/6, Apr. 7, showing interlocking plant to be installed at crossing of C.P.R. Owen Sound section by G.T.R., at Weston Road, Toronto.

21775. May 7.—Authorizing C.P.R. to build spur for Brunelle and Besner, Vaudreuil, Que.

21776. May 7.—Authorizing C.P.R. to build spur for Canadian Sewer Pipe and Clay Product Co., Hamilton, Ont.

21777. May 2.—Approving contract between Byron Telephone Co. and Bell Telephone Co. of Canada.

21778. May 7.—Ordering that crossing of Berlin and Northern Ry. by G.T.R. on Wellington St., Berlin, Ont., be protected by half interlocking plant, derrails on G.T.R. and semaphores on B. & N. R., each 100 ft. from diamond; G.T.R. to pay whole cost.

21779. May 7.—Ordering C.P.R. to build highway crossing at Pine St., Sault Ste. Marie, Ont.

21780. May 7.—Ordering that crossing of G.T.R. by Berlin and Northern Ry., at Bridgeport St., Berlin, Ont., be protected by half interlocker, derrails on B. and N. R. to be 100 ft. from diamond, semaphores on G.T.R. to be 300 ft. from diamond; B. and N. R. to pay whole cost.

21781. May 7.—Reducing joint commodity rates of Chatham, Wallaceburg and Lake Erie Ry. and Pere Marquette Rd., in connection with G.T.R. and C.P.R., for carriage of sugar, in carloads, from Wallaceburg, Ont., to Hamilton and Toronto, to 10½¢ per 100 lbs. and 11½¢ per 100 lbs., respectively, on minimum of 40,000 lbs. per carload; effective by May 25.

21782. May 6.—Authorizing C.P.R. to build extension to spur for Francis Hankin and Co.,

and Canada Sand and Concrete Co., St. Charles Borromeo Parish, Que.

21783. May 7.—Extending, to July 1, time within which G.T.R. shall submit for approval location of new station at Summerstown, Ont.; work to be completed by Nov. 1st; and ordering G.T.R. forthwith to remove certain telegraph poles and to provide 4 wheel truck to carry milk and cream to movable platform on south side of present platform.

21784. May 8.—Amending order 21728, April 29, re farm crossing over G.T.R. and C.P.R., Pointe Claire Parish, Que.

21785. May 8.—Authorizing C.P.R. to operate over portion of its Weyburn Westerly Branch from Woodrow to Shaunavon, mileage 145.7 to 230.8, at speed not exceeding 25 miles an hour, instead of 18 and 10 miles as provided in order 21227.

21786. May 8.—Disallowing tariffs and supplements applicable to international traffic filed by G.T.R., Michigan Central Rd., Wabash Rd., C.P.R., and Pere Marquette.

21787. May 8.—Authorizing G.T.R. to operate over 25 bridges on District 15, Ont.

21788. Apr. 29.—Ordering Canadian Northern Ry. to build a road north of its tracks, connecting road allowance between Secs. 5 and 8-18-21, with some street in Elphinstone, Man., work to be completed by June 15; 20% of cost to be paid out of the railway grade crossing fund.

21789. May 12.—Suspending provisions of order 21621, Apr. 9, re increased rates on lumber as shown in Supplement 51 to G.T.R. tariff C.R.C. no. E.2318; C.P.R. tariff C.R.C. no. E.2779 and C.N.R. tariff C.R.C. no. E.419, in respect of stations between Montreal and Ottawa, and Montreal and Hull, including Point Fortune, Hawkesbury, and Rockland branches; also between Hull and Waltham, Hull and Maniwaki, and Ottawa and Pembroke, and reinstating rates charged during 1913, effective one week from date, and dismissing complaint against increased rates to Montreal for local delivery.

21790. May 11.—Authorizing C.P.R. to use bridges 133.28 and 102.55, Algoma Subdivision, Lake Superior Division, Ont.

21791. May 12.—Approving clearance between C.P.R. standard coal sheds and side tracks, and rescinding order 21446, March 5.

21792. Apr. 30.—Amending order 21281, Feb. 7, 1914, re crossings over G.T.R. adjoining Front St., Toronto.

21793. May 13.—Authorizing Canadian Northern Ry. to build across and divert highways between Secs. 20 and 29-38-26 and Secs. 29 and 30-38-26, w. 2 m., near Dana, Sask.

21794. May 13.—Authorizing C.N. Ontario Ry. to divert Symes Road in Lot 37, Con. 3, York Tp., and carry same under railway by a subway; clear head room 14 ft. and clear width 20 ft.; grade on north approach to be changed to 5%.

21795. May 12.—Approving location of C.P.R. station at Larchwood, Lot 11, Con. 3, Balfour Tp., Ont., mileage 96.25, Cartier Subdivision, Ont.

21796. May 13.—Authorizing C.P.R. to build road diversion in Sec. 1-15-14, w. 3 m., Sask.; and to build its Swift Current Southeasterly Branch across same at mileage 4.78, without prejudice to Saskatchewan Government's right to apply at any future time for separation of grades there.

21797. May 13.—Authorizing C.P.R. to build through siding at grade across Inches Ave. and La Croix St., Chatham, at mileage 64.86, Windsor Subdivision, Ont.

21798. May 13.—Authorizing C.P.R. to rebuild bridge 103.25 near Auburn station, Ont.

21799. May 14.—Extending to Aug. 15 time within which C.P.R. shall complete subway at Dundas St., Woodstock, Ont.

21800, 21801. May 14.—Approving revised location of C.P.R. main line as built, and of double track from mileage 51.49, Schreiber Subdivision, to mileage 54.37, in Lot 11, R. 6, Pic Tp., and from mileage 10 to mileage 14, in Mining Location 85 Z, Tp. 86, Thunder Bay District, Nipigon Subdivision, Ont.

21802. May 13.—Approving Bell Telephone Co.'s agreement with Pontiac Rural Telephone Co., April 3, for interchange of business.

21803. May 14.—Approving location of C.P.R. station at Ringold, mileage 70.99, Windsor Subdivision, Ont.

21804 to 21806. May 14.—Authorizing C.P.R. to build spurs for G. White & Sons Co., Moose Jaw, Sask.; Mond Nickel Co., Coniston, Ont., and T. Fletcher, Calgary, Alta.

21807. May 14.—Relieving Canadian Northern Ry. from speed limitation of 13 miles an hour from Oak Point to Gypsumville, Man., 97 miles; and ordering that fencing from mileage 69 be completed by Oct. 1st.

21808. May 15.—Authorizing C.N. Ontario Ry. to build bridge over Raimbault Creek, St. Laurent Parish, Que., mileage 48.07 from Hawkesbury; and rescinding orders 19657 and 21650, June 21, 1913, and Apr. 15 respectively.

21809. May 11.—Approving G.T. Pacific Ry. plans of stresses of superstructure and details of substructure of bridge, across Nechaco River, mileage 371.4 Prince Rupert Easterly, B.C.

Electric Railway Department

The Postmaster-General and the Transportation of Postmen.

On Feb. 21, 1913, the Postmaster General introduced, and secured the first reading in the House of Commons, of a bill of three clauses, to provide that postmen be conveyed on every electric railway in Canada on such terms and conditions and under such regulations as might be made by the P.M.G., and that if any electric railway company refused to carry postmen at the amount fixed by the P.M.G., the company should refund an amount equal to the difference between the amount so fixed and the amount actually expended for such carriage, and the act was to be made retroactive from March 1, 1913. A deputation from the Canadian Electric Railway Association waited on the P.M.G. as quickly as possible, protesting most strongly against the arbitrary nature of the bill, and the Premier was also waited on, and towards the end of the session the bill was withdrawn. At the interview referred to with the P.M.G., it was suggested, on behalf of the electric railway companies, that in case of dispute between the P.M.G. and any company, the matter be referred to the Board of Railway Commissioners, but Mr. Pelletier declined to accept this suggestion.

At the session of Parliament which closed recently, the P.M.G. introduced a bill, entitled, "An Act to Amend the Post Office Act," dealing with a number of matters, including postage on newspapers, etc., registration and insurance letters, and appointments and salaries of railway mail clerks, and towards the end of the bill the first two sections of the 1913 bill in regard to transportation of postmen were included, with the exception that the words "except municipally owned electric railways" were inserted, thus exempting municipally owned lines and dealing only with electric railways owned by companies. This bill was carried through the Commons without the interests affected having any notice of it, and it was not distributed to the press or public until after it had received its third reading on May 4.

Steps were then immediately taken by the Canadian Electric Railway Association's Secretary-Treasurer to secure a delay of the bill in the Senate until representations could be made against it. Its provisions were fully discussed at the Association's annual meeting in Ottawa, May 13 and 14. On the following day the Association's then retiring President, Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co., and the Association's Secretary-Treasurer, Acton Burrows, remained in Ottawa in connection with the matter. Owing to the representations made, the bill was further delayed from time to time in the Senate. The Government leader there, Senator Loughheed, proposed to have it referred to a committee of the whole house after its second reading, but as this would have prevented the Association from being heard, Senator Young moved that it be referred to the Committee on Banking and Commerce, which was carried, and its consideration fixed for May 27. Mr. Burrows attended at Ottawa on that day, but the committee's whole session was taken up in considering the first section of the bill, relating to the rates of newspaper postage, and the committee adjourned till May 29, when Mr. Burrows returned to Ottawa and was given an opportunity of addressing the committee and stating the Association's case. A full report of his

remarks, which, at the suggestion of one of the members of the committee, was immediately printed and distributed to all the senators, is given on page 333 of this issue. He was followed by Andrew T. Thompson, Ottawa solicitor of the British Columbia Electric Ry. Co., and T. Rinfret, of the Montreal Tramways Co.'s solicitors' office. The P.M.G., who adopted the unusual practice of a minister with a seat in the Commons, appearing before a Senate committee to urge the passing of a bill, spoke in reply, and Mr. Burrows was allowed to speak again in rebuttal of some statements Mr. Pelletier made. When 1 p.m. had been reached, further considera-

principles of arbitration. As it was evident that a majority of the committee was against the proposed amendment, the P.M.G. evidently thought it best not to press it any further, and Senator Loughheed, on behalf of the Government, then introduced the following amendment:— electric railways, or any of them, and the Department, the terms and conditions shall be fixed by the Board of Railway Commissioners for Canada, and in so doing due regard shall be had by the Board to terms and conditions agreed upon theretofore between the said electric railways, or any of them, and the Department."

Senator Loughheed also moved to strike out sec. 9 of the bill requiring electric railway companies to refund any amounts charged for fares in excess of rates fixed by the P. M. G. As the first part of Mr. Loughheed's amendment was in accordance with the action taken on behalf of the Association on Feb. 28, 1913, when it was suggested to the P.M.G. that in case of dispute as to compensation to be paid, the matter be referred to the Board of Railway Commissioners, a suggestion which he then referred to the Board of Railway Commissioners, a suggestion which he then refused to entertain, Mr. Burrows did not oppose the amendment, but suggested that the following words be omitted, "and in so doing due regard shall be had by the Board to terms and conditions agreed upon theretofore between the said electric railways or any of them and the Department." This, however, Mr. Loughheed would not agree to. Senator Mitchell then moved that secs. 8 and 9 of the bill be struck out altogether. Mr. Loughheed's amendment was finally adopted by a vote of 10 to 9.

In view of the fact that the bill was a Government measure and that it had been passed by the House of Commons without a division, it could hardly be expected to secure its entire rejection, and the result was considered very satisfactory, the Government having practically accepted the Association's contention of last year, and the proposal to clothe the P. M. G. with arbitrary power without any right to appeal having been rejected.

The Senate's Committee on Banking and Commerce also made an amendment to the clause of the bill relating to newspaper postage which the Commons, at the P. M. G.'s instigation, refused to agree to. When the bill again came up in the Senate on June 10, Mr. Burrows, who was also interested in the newspaper postage question, had returned to Ottawa, and in conjunction with other publishers, made such representations that the Senate, by a vote of 28 to 13, refused to give the P. M. G. the power to decide the rates of postage to be paid on newspapers, a power which has been vested in Parliament ever since Confederation and which he attempted to take away from that body and give to himself. The bill in its amended form went back to the Commons once more, and as the P. M. G. would not consent to the Senate's amendment to make newspaper rates subject to parliamentary approval, the bill was dropped.

The net result, therefore, is that matters are in exactly the same position as they were before the bill was introduced, and that the compensation to be paid for the transportation of postmen is still a question to be settled by negotiations between the Postmaster General and the different electric railway companies.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY-TREASURER—Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY—Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

tion of the bill was adjourned to June 1, when the P.M.G. appeared before the committee with the following suggestion for an amendment to the bill:—

"If any electric railway objects to such terms and conditions within eight days after it has been duly notified of same, the Postmaster General will, by petition duly served, apply to the Board of Railway Commissioners, which is hereby empowered to order any electric railways to accept such terms and conditions if it is found that they are on the whole about the same as those now in force, and to vary them only if there are special circumstances which might justify a different decision in any special case. The same rule will apply in case any terms and conditions now prevailing are to be revised by the Postmaster General."

Mr. Burrows protested most vigorously against the proposed amendment, pointing out that its adoption would effectually tie the Board of Railway Commissioners' hands and that it was absolutely foreign to the

Acton Burrows on Compensation for Carrying Postmen on Electric Railways.

Acton Burrows appeared before the Senate Committee on Banking and Commerce, in Ottawa, May 29, and made the following remarks:

Honorable Gentlemen:—The day before yesterday and today are the first occasions on which I have had the honor of appearing before a parliamentary committee, and I respectfully crave your indulgence, as, although not young in years, I am young in experience of this nature. Allow me to explain that I am the publisher of a technical paper, the Canadian Railway and Marine World, and am also Honorary Secretary-Treasurer of the Canadian Electric Railway Association, composed of 90 per cent. of the principal electric railway companies from Cape Breton to Vancouver.

The object of this association is, as set out in its constitution, the acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of electric railways, and the diffusion of this knowledge among the members of the Association, with the view of increasing the accommodation of passengers, improving the service, and reducing its cost, and the encouragement of cordial and friendly relations between the roads and the public.

The sections of this bill to which we take exception are numbers 8 and 9, which read as follows:—

"8. Letter carriers in the service of the Post Office Department shall be conveyed on every electric railway in Canada, except municipally owned electric railways, on such terms and conditions, and under such regulations, as are made by the Postmaster General.

"9. If any company operating such electric railway refuses to carry any such letter carrier at the amount so fixed by the Postmaster General, the company shall refund an amount equal to the difference between the amount so fixed and the amount actually expended for such carriage."

The companies affected by these sections had no notice of the introduction of the bill in the Commons, and no chance to be heard before any committee of that House. The first we heard of it was a report in the daily press that it had passed its third reading, so that this is the first opportunity we have had of expressing our views. The bill was not distributed to the public until after it had been read a third time, and the first copy of it which reached me came in the same package as the Commons Debates of May 4, which contained the discussion on the third reading.

Against the provision that electric railways, other than those municipally owned, shall carry postmen at whatever rate the Postmaster General of the day may decide, we respectfully enter a most emphatic protest. As a matter of right, the Dominion Government has no claim on electric railway companies for the performance of any service on exceptional terms.

Parliament has empowered the Governor in Council, not the Postmaster General, (See R. S. 1906, chap. 66, sec. 115) to fix the rates to be paid the railways for the transportation of mails. These mails are carried almost entirely by steam railways, which have received Dominion subsidies in aid of construction. Personally I do not think this power should be vested even in the Governor in Council, but that the matter should be dealt with by a body such as the Board of Railway Commissioners. On the other hand, it can be argued that the steam railways have been subsidized and that, therefore, they should perform certain duties for the Government on exceptional terms. But with electric railways the position is entirely different. Not one of them, urban

or interurban, has received any subsidy from the Dominion, with the single exception of the Oshawa Railway, in Ontario, which was originally promoted as a steam railway and was voted a subsidy in aid of construction, but was subsequently built as an electric line.

We submit that there is no reason why postmen should be carried at any less rate than any other passengers. As a matter of fact, with their bags of mail matter, they take up more room and weigh more than ordinary passengers. There is no reason why they should not be supplied by the Post Office Department with tickets bought at the ordinary rate.

But the electric railway companies were willing to be reasonable with the Department, and to save it trouble, and with this end in view, some years ago, a number of the companies entered into contracts to transport postmen at a lump sum per man per year. The electric railway industry was then almost in its infancy. The lines had not been in operation a sufficient time to enable accurate cost data to be worked out, but when this was done it was found that some of the contracts had been taken at ridiculously low rates, and that the companies were actually losing money on them. In 1909 the Canadian Electric Railway Association conducted an investigation, and as a result, came to the conclusion that it did not pay to carry postmen at less than \$50 each per year, which, of course, works out at less than \$1 per week, and that in the larger cities, with wide areas and long distances of travel, the rates should be higher.

The rates asked of recent years by the electric railways are not necessarily excessive because they are higher than those originally accepted. The companies would be perfectly justified in asking that the lump sum per postman per year should be as much as would be paid if they were supplied with tickets at ordinary rates. Since the first contracts were made with the Department, the expenses of conducting street railway transportation have vastly increased, particularly wages, and all construction work, rolling stock, and other supplies have largely advanced in price. As a result, the cost of transportation per passenger is considerably higher than it was a few years ago.

In the United States a straight 5 cent cash fare is almost universal, and the necessity for higher fares in Canada is illustrated by the cases of several of the municipally owned lines in the northwest, for example Edmonton, which has recently advanced its rate to 5 cents, except for limited tickets during certain hours. Saskatoon is following suit, and in Lethbridge and Brandon it has been necessary to adopt one-man cars, that is, to have one man act as both motorman and conductor in order to make ends meet.

Last year the Postmaster General introduced a bill of three sections, practically the same as sections 8, 9 and 10 of the present bill, but without the words "except municipally owned electric railways," which made it apply to all electric railways. We had an interview with the Postmaster General, and other members of the Government were subsequently called upon, and the bill was withdrawn.

We asked the Postmaster General for a conference between himself and his officers and representatives of our Association, but we have not been accorded this, and the withdrawn bill of last year has been again brought in as part of a general bill, but

with the municipally owned electric railways excepted. I have no hesitation in saying that the true reason why municipally owned railways have been excepted is because the Union of Canadian Municipalities took strong exception to last session's bill, and had they been included this year, similar opposition would have again been offered by the municipalities interested. The managements of many of the municipally owned lines are far from satisfied with the rates they have been getting, and I know that in several cases they want more.

It has been charged by the Postmaster General that some electric railways have been extortionate and have attempted to hold up the Department. We take emphatic exception to that statement.

The companies have also been charged with having no consideration for the postman. This is equally foundationless. It is the duty of the Department, not of the electric railways, to provide for carrying postmen and to give them every facility for making speedy delivery of letters. This is recognized by the provision in the Post Office Act (R.S., 1906, sec. 73, ss. 2), which reads as follows:—"In places enjoying the free letter carrier delivery system, the Postmaster General, in lieu of paying street railway companies for the transportation of letter carriers, may pay to any carrier, to defray his cost of transportation, a bulk sum not exceeding \$50 a year, but this provision shall not apply to places where carriers are entitled to free street railway transportation."

The Postmaster General is thus given the power to allow postmen up to \$50 a year to pay their transportation on electric railways, yet when electric railways ask that figure, he accuses them of being extortionate, etc. We challenge the fullest investigation of the whole question, which would undoubtedly show that the electric railway companies have been most reasonable in their demands.

Last year, in an interview with the Postmaster General, we said "We are so sure of the reasonableness of our case that we are willing to leave the matter in the hands of the Board of Railway Commissioners, a body appointed by the Government." The Postmaster General replied, "No, I will not agree to that, as the Board would probably decide according to the value of the service." In other words, that he is not prepared to pay what the service is fairly worth. It is therefore evident that the Postmaster General has not an open mind on the question, and we object to the rate of compensation being left to him, or to any other one person.

If the Postmaster General is to be given the power to say what shall be paid for carrying postmen, why should he not be given similar arbitrary power to compel manufacturers to make letter boxes for the streets, the mail bags the locks for the boxes, the postmen's uniforms, and everything else the Department requires, at any rates he may determine?

The Postmaster General is not willing to accord to electric railways even the same rights as ferrymen have, namely arbitration. The Post Office Act (R.S., 1906, chap. 66, sec. 88) provides as follows: "Every ferryman shall, upon request, and without delay, convey over his ferry any courier or other person travelling with the mail, and the carriage and horse or horses employed in carrying the same; and the sum to be paid for such service may be fixed by contract; or if any ferryman demands more than the post office authorities or the contractor for carrying the mail are willing to pay, the amount to be paid shall be fixed by arbitrators, each party naming an arbitrator, and the two arbitrators naming a third; and the decision of any two of such arbitrators shall be

binding." Yet while a ferryman has the right of being protected by arbitration the Postmaster General is not willing that electric railways should have such a right, but wishes to have them accept whatever he may determine.

One of the most important objections to this bill I have left to the last. A large majority of the electric railway companies throughout Canada were chartered by provincial legislatures, not by the Dominion Parliament. I submit that this Parliament cannot enact laws to govern the provincially chartered companies.

When this bill was under discussion in the Commons, the honorable member for Moose Jaw said: "Take the Moose Jaw or Toronto street railway companies, incorporated by provincial legislatures. Their rates are subject to whatever bodies the legislature may create in the shape of a provincial railway commission. I very much question if this house has power to say to a provincially created company, 'You will carry people at a certain price,' we might as well say we have power to compel a 3 cent rate in Toronto."

And in the Senate on May 19, the Hon. Mr. Casgrain said: "I want to draw the attention of the Government to the fact that the ipse dixit of the Postmaster General would regulate the fares to be charged on electric railways, which are not under the jurisdiction of this Parliament—for instance, provincial railways. Now, we have utilities commissions in some Provinces to regulate that very point. There should be some sort of appeal, so that if there was no agreement between the companies and the Postmaster General, surely it would be right to amend this clause by letting it go to the Railway Board or other body."

The Postmaster General says the Department of Justice has given an opinion that the bill is *intra vires*. But the Department of Justice is not incapable of erring. Some opinions that it has given have failed to be upheld by the courts. On the other side, we have the opinions of several counsel, including Mr. H. A. Lovett, K.C., who is recognized as one of the ablest authorities in Canada. In a lengthy opinion which he has given, he says: "In my opinion a statute of Canada attempting to compel a provincial railway to transport letter carriers free of charge, or for an arbitrary sum to be fixed by the Parliament of Canada, or by some official appointed under the act, would be *ultra vires* of the legislative jurisdiction of that Parliament."

Should sections 8 and 9 pass, and any Postmaster General attempt to act under them, the provincially chartered companies, at least, would undoubtedly test the validity of the act, and another struggle for provincial rights would be precipitated.

In conclusion, we respectfully ask you not to approve of sections 8 and 9, because:

1. There is no necessity for their enactment.
2. Such arbitrary powers should not be given to any one man.
3. Their enactment would practically establish a bureaucracy, with the Postmaster General of the day as the chief bureaucrat.
4. They are altogether of too arbitrary a nature for enactment in a democratic country.
5. They are *ultra vires* in regard to provincially chartered electric railways.

Walter Carey, of the Canadian Northern Ontario Ry. engineering staff, Pembroke, Ont., writes: "I have read your circular with regard to the increase in Canadian Railway and Marine World subscription rates and may say that I have wondered how you could sell such a strictly first class publication for so small a price."

Personal Paragraphs.

Mrs. McLean, wife of H. H. McLEAN, K.C., M.P., President, St. John Ry., died at St. John, N.B., June 11.

R. M. HANNAFORD, Assistant Chief Engineer, Montreal Tramways Co., has been



George Kidd,
General Manager, British Columbia Electric
Railway.



D. W. Houston,
Superintendent, Regina Municipal Railway.

elected Second Vice President, Canadian Railway Club.

T. AHEARN, President, Ottawa Electric Ry., was one of the stewards at the spring meeting of the Connaught Park Jockey Club, during June.

C. JOHNS, electrician, St. Thomas St. Ry., has resigned, as the committee desired to remove him from the street railway department to the hydro electric department.

Miss Todd, only daughter of MARTIN N. TODD, President, Galt, Preston and Hespeler Street Railway, was married to A. H. T. Basett, of Edmonton, Alta., at Galt, recently.

W. T. WOODROOFE, who recently resigned as Superintendent, Edmonton Radial Ry., Edmonton, Alta., and who was formerly in British Columbia Electric Ry. service, is preparing a report on electrolysis conditions in Vancouver for the city.

In Canadian Railway and Marine World for June, under "Birthdays of Transportation Men," the date of birth of ALLAN PURVIS, Manager Interurban Lines, British Columbia Electric Ry., New Westminster, B.C., was given as June 29, 1864, instead of June 29, 1878.

GEORGE KIDD, whose appointment as General Manager, British Columbia Electric Ry., Vancouver, was announced in our last issue, and whose portrait appears in this issue, entered B. C. Electric Ry. service in Jan., 1908, since when he has been, to Mar., 1911, Secretary of the company, London, Eng.; Mar. 1911, to May 6, 1914, Comptroller and assistant to General Manager, Vancouver.

DAVID W. HOUSTON, whose appointment as Superintendent, Regina Municipal Ry., Regina, Sask., was mentioned in a previous issue, and whose portrait appears in this issue, was born at Bathurst, N.B., Jan. 3, 1879, and entered transportation service in July, 1899, since when he has been, to 1902, clerk, Chicago, Burlington and Quincy Ry., Omaha, Neb.; 1902 to 1907, student, School of Mining, Queen's University, Kingston, Ont., graduating therefrom with the degree of B.Sc.; during the vacations he occupied various mining and engineering positions; May to Oct., 1907, Inspector of Mining Claims, Ontario Government, Montreal River District; 1908 to 1913, Auditor and acting Manager, Tabor and Northern Ry., Tabor, Ia.; July 13, 1913, to Mar. 12, 1914, Assistant Superintendent, Regina Municipal Ry., Regina, Sask.; Mar. 12, to Apr. 30, acting Superintendent in charge of operation, same railway; May 1 to May 12, 1914, acting Superintendent, same railway.

Increase of Fares on Edmonton Radial Railway.

It became necessary recently to advance fares on the Edmonton Radial Ry., which is owned by the city of Edmonton, Alberta, in connection with which we have been furnished with the following information:—The city council has authorized the adoption of a 5c. cash fare for adults, with unlimited tickets for adults at 5 for 25c. Limited tickets for adults are sold at 8 for 25c., good only between 5 and 8 a.m. on week days. Children's tickets are sold at 12 for 25c., good at all times. In adopting the 5c. cash fare it was felt that it would be an advantage to continue selling tickets, and this has already been proved correct by the fact that large numbers of tickets are being sold at 5 for 25c. Selling tickets assists the conductors, as if none were sold they would have to carry a large amount of change and it would take up a good deal of their time making change for passengers. Good financial results are being expected from the increase in fares and the change will be watched with much interest.

The first p.a.y.e. cars were put into service on the Winnipeg Electric Ry., May 27.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—The Vancouver City Council has granted a permit for the erection of the new double deck car barn at Fourteenth Ave. and Main St., to Westinghouse, Church, Kerr and Co. The estimated cost of the work is \$300,000. A description of this building was given in Canadian Railway and Marine World for Nov., 1913. pg. 542.

Work is in progress on the extensions on Commercial Drive, Fourth Ave., and Main St., Vancouver.

A contract is reported let to M. J. Coughlan and Sons, for the substructure of a steel bridge across False Creek at Kitsilano, on the Eburne line, to replace the present wood-
en trestle.

It is reported that material is being assembled for the extension of the line from Burnside Road to Harriet Road, Victoria.

Application is being made to the Victoria City Council for permission to lay a second track on Esquimalt Road, between Dundas and Catherine streets. The company proposes to lay a second track on the entire line from Point Ellice bridge to the terminal. There is a narrow place on the road in the section referred to, and the City Engineer will investigate the matter and report.

In connection with the agreement made under which freight will be exchanged at Sumas, with the Chicago, Milwaukee and Puget Sound Ry., it is reported that the connecting line for the interchange of traffic will be about three miles long, and that it will run from near Sumas, connecting with the B. C. E. Ry. at Huntingdon, B. C., and will be built by the C., M. and P. S. Ry. (June, pg. 283.)

Cape Breton Electric Co.—We are officially advised that the company has a franchise for the building of extensions of its lines to New Waterford and Florence, N. S. The supplementary agreement recently made was to clear up a point in the original document as to the date on which the agreement came into effect in regard to the extension to New Waterford. There is nothing new in the way of arranging for construction. The company has applied to the Lieutenant Governor in Council for the necessary approval of the rates of fare and schedules proposed to apply to the extension. It is expected that construction will be started in accordance with the agreement. E. L. Milliken, Sydney, N. S., is Manager. (June, pg. 283.)

Edmonton Interurban Ry.—B. J. Arnold, Chicago, Ill., was in Edmonton, Alta., at the end of May, looking over the company's property, and the territory to be operated by its various projected lines, with a view of, a press reporter says, advising as to possible extensions of the line, and as to the most economical means of securing power for its operation. The line from Edmonton to St. Albert, we were advised in February, was being operated by a gasoline motor car. The press reports quoted stated that until Mr. Arnold's report was received and considered, nothing could be done in the way of operating the line. This statement would suggest that the gasoline car has not proved satisfactory, and that another motive power is to be considered. The first extension project which the company proposes to consider, the report adds, will be from the present terminus at St. Albert to Fort Saskatchewan, but we were officially advised, April 27, that the company was not contemplating such an extension. (May, pg. 231.)

Edmonton Radial Ry.—\$15,573.34 has been set aside by the Edmonton, Alta., City Council,

for a site for a car barn, out of the money authorized to be raised under the recent bylaws. (June, pg. 283.)

Fort William Electric Ry.—The Fort William, Ont., City Council has let a contract for four diamonds to Canadian Steel Foundries, and for a fifth in the U. S. These are for use on extensions of lines. (May, pg. 231.)

Hamilton St. Ry.—Relaying the tracks on King St. east, between James and Catharine streets, is practically completed. (June, pg. 283.)

International Suburban Ry.—The application for the incorporation of a company with this title to build an electric railway near Windsor, Ont., with a ferry or tunnel connection with Detroit, Mich., was withdrawn from Parliament, June 4. (June, pg. 282.)

Kingston, Portsmouth and Catarqui Electric Ry.—Work was started on putting in the foundation for relaying the tracks on King St., Kingston, Ont., May 25, and the entire work is reported to have been completed. It is also reported that the laying of a second track on Barrie and Alfred Streets has been finished. (June, pg. 283.)

The relaying of the tracks on Princess St. is completed, and service was started over the new tracks, June 17.

Lacombe and Blindman Valley Electric Ry.—We are officially advised that the general route of the line will be from Lacombe, Alta., westerly to the south end of Gull Lake, approximately 11 miles, then west to Bentley, 8 miles, thence following the Blindman River Valley to Rimbey, 14 miles. The line will be built on a private right of way; with a gradient 1% compensated, and a maximum curvature of 6 degrees. Corrugated iron and cedar box culverts will be used. A wooden trestle 700 ft. long and 60 ft. high will be built across the Outlet Creek running from Gull Lake into the Blindman River. The track will be built with 60 lbs. steel rails, G. T. Pacific Ry. specifications. The system of telephone has not been decided. Farncomb and Inkster, Edmonton South, Alta., are the engineers. (May, pg. 231.)

London and Port Stanley Ry.—The Dominion Parliament has confirmed the lease of the line to the City of London, and authorized the electrification of the line, and the management of the same by a commission. The city may, for the purposes of its undertaking, operate steam or other vessels to and from Cleveland, Ohio.

The city is authorized by the bylaw passed in connection with the lease to expend \$700,000 on the electrification. It is said that much of the preliminary work for the electrification is being pushed forward, and that all the plans for it will be completed during this year in order that actual construction may be started in the spring of 1915.

We are officially advised that the only orders placed by the commission, which has in charge the electrification of the line, are for railway ties to the Manitoulin Lumber Co., and local reports state that the orders are for 75,000 ties, and 3,000 tons of rails.

Daily papers have been busy speculating as to when the contract for the electrification of the line will be let. Engineers of the Pere Marquette Rd., and of the Michigan Central Rd., which are both interested in the operation of the line, have been inspecting it, and have been in consultation with the Commissioners, and F. A. Gaby, Chief Engineer Hydro Electric Power Commission of Ontario, in connection with the

matter. Representatives of several contracting firms have also gone over the line, but the reports state that the contract will be given to the Michigan Central Rd.

The specifications prepared for the work are very voluminous, and it is said that in many respects they are to be the standard for any lines which may be built in connection with the radial railway building plans under the Hydro Electric Power Commission of Ontario. The work in this case differs from the building of a new line, in that it consists first of all of the rebuilding of an existing line, on which traffic is to be carried during construction, and its electrification. The expectation is that the present line will be reconstructed, with a second track between London and St. Thomas, and long passing tracks at several points between St. Thomas and Port Stanley. It is not likely that the work will be let in one general contract, but that the rebuilding of the line will form one contract, and the electrification another.

London St. Ry.—An agreement has been signed between the city and the company as to the operation of traffic on the London West Line, for three months, pending the installation of a switch at Wharncliffe Road. (Dec., 1913, pg. 593.)

Medicine Hat, Alta.—The City Council has authorized the City Engineer to prepare estimates of the cost of electrifying the line built by the city to connect with the Ansley coal mine.

Montreal Tramways Co.—The Montreal Board of Control decided June 4, to permit the company's tracks to remain on City Hall Ave., between Ontario and Sherbrooke streets, notwithstanding the fact that traffic over that section had been abandoned. The city was desirous of having the tracks removed so that the whole street might be asphalted, but E. A. Robert, President, wrote stating that the company desired to have the tracks remain, as it was desired to use them at some future time. (April, pg. 184.)

The tramways situation was discussed between representatives of the company and the Board of Control, June 16, and after two hours of private discussion an adjournment was made to June 23.

Moose Jaw Electric Ry.—The extension of the line through Kingsway Park, Moose Jaw, Sask., was opened for traffic May 20. (May, pg. 231.)

The Montreal City Council took into consideration, on June 8, a report of the Board of Control upon transportation in the city. The council referred the report back, requesting the Board to resume negotiations with the M. T. Co., but declining to appoint any members of the council to act with the board.

Ottawa Electric Ry.—We are officially advised that the company is building a new steam plant. The building is of brick on concrete foundation, with concrete roof. The boiler room is 86½ by 40 ft. and 48 ft. high, will be equipped with three Babcock and Wilcox marine type water tube boilers, with integral superheaters, having a capacity of converting 90,000 lbs. of water per hour, with 200 lbs. steam pressure. Each boiler will be fitted with a 5½ ft. smoke stack, 60 ft. long, with induced draught fan driven, by separate motor on each fan. The coal will be kept in a concrete lined steel bunker of 300 tons capacity. It will be crushed, elevated to the bunker and carried in spouts to the hoppers where it will pass to Babcock and Wilcox chain grate motor driven stokers. The ash will be removed by spiral conveyors, elevated to a hopper, and delivered outside the building through a spout. Water will be fed to the boilers by two Weir vertical pumps, each capable of supplying all the boilers. The

coal crusher, elevator and conveyor, and the ash handling machinery will all be motor driven.

The engine room is 86½ by 25 ft., and 30 ft. high. It will be equipped with one 4,000 k. v. A., 2,400 volt turbo generator 3,600 r.p.m. The field will be excited by a 60 k. w. 125 volt, d. c. generator direct connected to a 90 h. p. 440 volt induction motor. The engine room will also contain a 1,000 k. w. motor generator set.

The Ottawa City Council proposes to reopen with the company the question of the erection of a bridge over the Rideau Canal. The company desires the building of a high level bridge at a cost of \$205,000, while the city favors a low level bridge, with an electrically operated draw span, at a cost of about \$100,000. The city has legislative authority to expend \$80,000 as its share of the cost.

Prince Albert, Sask.—Press reports state that the City Council has not made any investigation of the possibility of building a municipally owned electric railway. An application for a franchise in the city has been made by the interests owning the Moose Jaw Electric Ry., and this is under consideration.

Rainy River Radial Ry.—The Dominion Parliament has granted an extension of time for starting construction of this projected electric railway in the Rainy River District, Ontario. (Jan., 1913, pg. 39.)

Saskatoon Municipal Ry.—The by-law to provide \$15,000 for a site for a new power house, which was defeated in May, was again submitted to the ratepayers of Saskatoon, Sask., June 5, and was carried by 543. The new power house is required to take care of increasing demands of electric railway, power and lighting purposes. (June, pg. 283.)

Sudbury, Copper Cliff Suburban Electric Ry.—Press reports state that grading has been started in Sudbury, Ont., on this line, which is to connect Sudbury, Copper Cliff and other places. The Mayor of Sudbury turned the first sod May 30. C. McCrea, M. P. P., announced that it is the intention of the company to have the line from Sudbury to Copper Cliff completed this year, and after that extensions will be made to the various outlying centres around Sudbury. There are three lines at present contemplated, namely, Copper Cliff route, 5.1 miles; Ramsay Lake route, 1.2 miles, and Frood Mine route, 1.2 miles. The Town Council has the control of the track inside the town limits, and determines the method of construction. The company, therefore, let the contract for the concrete base and pavement to The Warren Bituminous Paving Co., which is doing the paving for the town. Ties are being delivered, and negotiations are in progress for rails. The franchise calls for the laying of girder rails, but the company is desirous of laying T rails, as these can be had at once, while girder rails are not so readily obtained. The Town Engineer favors the T rail, and the matter is in progress of settlement. C. D. Norton is engineer in charge of construction. (May, pg. 232.)

Toronto Eastern Ry.—We are officially advised that active work is in progress on the line. Steel has been laid between Oshawa and Bowmanville, Ont., and that portion is being ballasted. Steel is also laid from Oshawa to within a mile of Whitby. Grading was completed through the town of Whitby last spring, making a continuous grade between Pickering and Bowmanville. It is expected to have that portion of the line completed this year, and it is hoped also to complete a large percentage of the line between Pickering and Toronto. At

present time nothing definite has been decided as to the operation of the line. (June, pg. 284.)

Toronto Suburban Ry.—The steel superstructure for the bridge over the Credit River, north of Meadowvale, Ont., on the extension to Guelph and Berlin, Ont., has been delivered at Cooksville, and will be carried over the company's own tracks to the site. Track has been laid practically from the crossing of the Etobicoke to the crossing of the Credit, and some ballasting has been done. (June, pg. 284.)

Transcona, Man.—The application of the Transcona Town Council to the Lieut. Governor in Council, for approval of the agreement made with J. H. Kern, Moose Jaw, Sask., for the building of an electric railway from Transcona to Winnipeg, was heard June 4. Opposition was made to the contract by the residents of South Transcona on June 5.

The Lieut. Governor in Council confirmed the recommendation of the Public Utilities Commissioner approving of the contract, but made the stipulation that the line to be built in Transcona must serve the South as well as the North side of the tracks of the National Transcontinental Ry.

Windsor, Essex and Lake Shore Rapid Ry.—The Windsor, Ont., City Council has asked the company to remove its tracks on Howard Ave., from the side to the centre of the road. The city has let a contract for paving the avenue, and the proposal is that the tracks will be moved while this work is in progress. (June, pg. 284.)

Winnipeg Electric Ry.—Grading and other work is being pushed on the seven mile extension of the Stony Mountain line of the Winnipeg, Selkirk and Lake Winnipeg Ry., into Stonewall, Man. Kilping Bros. have the general contract, and have sublet a portion to W. Vincent.

The company is reported to have acquired a property with 300 ft. of frontage on Main St., Stonewall, for terminals and station house. Some materials for the buildings on the site were delivered May 27. (June, pg. 284.)

Woodstock, Thames Valley and Ingersoll Electric Ry.—We are officially advised that a rotary convertor has been purchased, and is expected to be installed in the power house by July 1, so as to have the line operated by hydro electric power. The extension to the fair grounds, Woodstock, is only a matter of construction along a couple of blocks, and track is expected to be laid on it by October. I. Warfield, Woodstock, Ont., Superintendent; J. G. Wallace, K. C., Woodstock, trustee for bondholders. (June, pg. 284.)

Three Rivers Traction Co.—We are officially advised that it is intended to build the loop line in Three Rivers, Que., with a connection to the water front. The contract for the franchise with the city is practically settled, and it is expected to start construction during July. The company proposes ultimately to build a line connecting the parishes on the north shore of St. Maurier River, from Portneuf to Berthier, about 80 miles. The directors are:—J. E. Aldred, T. McDougall, H. Murray, W. S. Hart, J. G. Smith, Montreal; S. Murphy, Ottawa. (Jan., pg. 39.)

Toronto and York Radial Ry.—The city has given notice to the company that it intends to assume the ownership of 1,220 ft. of the Metropolitan Division, on Yonge St., Toronto, the franchise of which will expire in 1915. The Corporation Counsel advised that while this was not necessary, the giving of such a notice might prevent complications when the franchise expires.

Report and Recommendations to the Ontario Railway and Municipal Board, re Toronto Railway.

Some time ago, on account of various complaints made to the Board in connection with the Toronto Ry. service, the services of C. R. Barnes, J. H. Cane, and J. M. Cameron were engaged, to report on the traffic generally, and to make recommendations for betterment. The report, which was presented recently, states that the quality of the service which a company can furnish is closely related to and must be equitably based on its earning power. Regarding additional cars, the present seating capacity of the cars, taken between 5.15 and 6.15 p.m., is given as 29,069, and it is recommended that this be increased by 10,813, half of this additional capacity to be made by Nov. 1, 1914, and the balance by Nov. 1, 1915. Increases of seating capacity are also recommended during the general rush hours, and on Sundays. Among other suggestions made are that cars be heated during the winter by modern heaters, one third of the cars to be equipped during this year, one third in 1915, and the balance by Nov. 1, 1916, also that the cars be equipped with legible route signs at the sides, and destination signs at the ends. The platforms of 202 double truck cars to be lengthened, 31 single truck cars and 71 closed trailer cars to be replaced by Nov. 1, and 29 new cars to be placed on new lines by the same date, plans of which are to be submitted to the Board for approval within 30 days.

The relaying of about 13½ miles of track, and extensions of existing track, are recommended as follows:—Extension on Wilton Ave. easterly through the new streets which the city is preparing to open, through the proposed subway under the G.T.R. and crossing the G.T.R. coal siding at grade, to Pape Ave., thence north to Danforth Ave., where the city runs a car line. As this would necessitate the building of a subway under the G.T.R. on Pape Ave., it is suggested that a stub line be run temporarily. It is estimated that approximately 9,000 people would be served by this line. A new intersection is suggested at College St. and Spadina Ave., where the congestion is particularly bad, caused by the number of car movements and alleged wrong track location. The intersection at College, Yonge and Carlton Sts. should also be relaid by the installation of special work, with curves so constructed as to permit of more freedom of car movement, and a similar recommendation is made as to the intersection at Broadview and Gerrard St.

A number of changes in routes are also recommended, involving a considerable amount of new construction, as follows:—Extension of tracks on Teraulay St., from Agnes to College, allowing of the removal of the College cars from Yonge St., and as soon as the proposed street extensions are opened up, the Teraulay St. line should be continued through to Bloor St., allowing of further rearrangement of routes; extension of the Bloor St. line from Lansdowne Ave. to High Park, subways to be built under the G.T.R. and C.P.R., pending which the Queen St. cars to be operated through to the Park on tracks to be laid; extension of the Harbord St. line through Ossington, Lappin, Hallam and Antler to Dundas St., requiring subways under the G.T.R. and C.P.R., pending which a stub line should be operated between the G.T.R. Northern Division and the main line; extension of new tracks through Macpherson Ave., from Avenue Road to Yonge St., allowing of the establishment of an additional belt line by connecting the Bathurst and Dupont lines, pending the construction of these lines a belt line to be operated by continuing the Dupont line on

its present route, requiring a curve connection from Bathurst to Dupont St., thus completing the track layout at this intersection for belt line operation. These track extensions are based on present traffic necessities and should be built in the immediate future.

Operation of the system with the proposed additional equipment and the re-routed lines would be facilitated by the erection of a new car barn and storage yard in the outlying sections of the eastern part of the city. The cost is given approximately as follows:—

Cars, 180 two car trains, at \$12,000	\$2,160,000
Track extensions and special work.	250,000
Power and rotary converters, 8,500 k.w. at \$40	340,000
Copper	200,000
Total	\$2,950,000

The report came before the Ontario Railway and Municipal Board, June 12, when counsel for the T. R. Co. stated that he was surprised at the short time which the company had been allowed to peruse the report, which involved such a large expenditure. More time must be allowed, and it might be necessary for him to call witnesses. The Chairman of the Board stated that the Board had accepted the report as it stood and did not propose to have witnesses called to dispute the evidence contained therein. All the company could do was to suggest a way or some means to overcome the conditions outlined in the report. A further hearing was held, June 26.

(Editor's note.—The foregoing approximate cost of the work as recommended does not appear to include any amount to cover the building of subways, the larger proportion of which would probably fall on the Toronto Ry., though grants would possibly be made from the railway grade crossing fund, and contributions ordered from the city and the railways concerned.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and allied companies.—Gross earnings for April, \$698,508; operating expenses, maintenance, etc., \$502,546; net earnings, \$195,962, against \$706,333 gross earnings; \$504,399 operating expenses, maintenance, etc.; \$202,234 net earnings for Apr., 1913. Aggregate gross earnings for 10 months ended Apr. 10, \$7,450,590; net earnings, \$2,024,821, against \$7,109,554 aggregate gross earnings; \$2,028,898 net earnings for same period, 1912-13.

Cape Breton Electric Co.—Gross earnings for April, \$27,916.65; operating expenses and taxes \$15,857.77; net earnings \$12,058.88; interest charges \$4,891.67; balance \$7,167.21; bond sinking and improvement funds \$1,190; balance for reserves, depreciation, etc., \$5,977.21, against \$26,505.11 gross earnings; \$16,694.57 operating expenses, taxes, etc.; \$9,810.54 net earnings; \$5,236.71 interest charges; \$4,573.83 balance; \$1,190 bond sinking and improvement funds; \$3,383.83 balance for reserves, depreciation, etc., for Apr., 1913. Aggregate gross earnings for 4 months ended Apr. 30, \$109,550.52; net earnings \$43,074.04; interest, bond sinking and improvement funds, \$25,359.79; net balance, \$17,714.26; against \$112,581.35 aggregate earnings; \$45,154.96 net earnings; \$24,402.82 interest bond sinking and improvement funds; \$20,752.14 net balance for same period 1913.

Grand Valley Ry.-Brantford St. Ry.—The several cases arising out of the affairs of these companies, in which the Brantford, Ont., City Council is involved, were on June 1 ordered to be removed from the lists in the Second Appellate Division Court of Ontario, without prejudicing the right of either party to have them restored on two days notice.

A meeting of bondholders was held in Toronto, June 15, but was adjourned to July 15, by which time it is expected that all the details in connection with the transfer of the lines to the city of Brantford will have been completed, and the papers ready for the final signatures.

Montreal Tramways Co.—It is reported that the earnings for the financial year ended June 30 will show a considerable increase over those of the previous year, and that for the first time in the history of the company they will exceed \$7,000,000. For the year 1912-13 the earnings were approximately \$6,754,227.

Ottawa Electric Ry.—Under the provisions of the mortgage trust deed of June 29, 1897, 15 shares of 4% debenture stock of \$1,000 each are to be drawn for redemption, with interest, on July 5.

Saskatoon Municipal Ry.—Revenue for first week in June, \$3,473, against \$2,948 for corresponding week in May. The receipts on June 6, were \$680, the largest amount of receipts for any day this year. The earnings are reported to be increasing since the straight 5c. fare was put in force; but the full effect of the change will not be noticeable for a few weeks, as the supply of reduced fare tickets in the hands of the public has not been exhausted.

Saskatoon Municipal Ry.—Traffic receipts for April, \$13,103, against \$12,296 for April, 1913. Passengers carried, 288,166; mileage of cars, 57,146, against 53,663 in April, 1913; gross earnings per car mile, 22.936 cents; operating expenses, 24.796 cents. Operating expenses, including interest on capital expenditure and sinking fund, \$14,168; deficit for month, \$1,065. Sutherland route.—Gross earnings, \$1,271; operating expenses, \$880; net earnings, \$391. Passengers carried, 19,673; car mileage, 5,161.

Toronto Ry., Toronto and York Radial Ry. and allied companies.—Gross earnings for April, \$830,299; operating expenses, maintenance, etc., \$443,103; net earnings, \$387,196, against \$760,676 gross earnings; \$397,875 operating expenses, maintenance, etc.; \$362,801 net earnings for Apr., 1913. Aggregate gross earnings for four months ended Apr. 30, \$3,292,255; net earnings, \$1,572,773, against \$3,028,408 aggregate gross earnings; \$1,446,107 net earnings for same period, 1913.

The Toronto Ry. receipts for May were \$534,465.77 against \$510,769.20 for May, 1913. The percentage of earnings paid to the city, which is now calculated on a 20% basis, was \$106,893.15, against \$102,153.84 in May, 1913.

Winnipeg Electric Ry. and allied interests.—Gross earnings for April, \$337,414; operating expenses, \$190,815; net earnings, \$146,599, against \$323,563 gross earnings; \$174,465 operating expenses; \$159,098 net earnings for Apr., 1913. Aggregate gross earnings for four months ended Apr. 30, \$1,418,875; net earnings, \$582,386, against \$1,324,509 aggregate gross earnings; \$582,668 net earnings for same period, 1913.

Fares Advanced in Saskatoon.—The Saskatoon, Sask., City Council passed a resolution recently increasing the fares on the municipally owned electric railway to a straight 5 cent fare. As heretofore workmen's tickets are sold at 8 for 25 cents, to be used between 6 and 8 a.m., and school children are carried at half fare to and from school. The 6 for 25 cents tickets outstanding will be honored. The change went in operation June 4. The reason for the change was the deficit of \$14,000 in operating the cars, and the Commissioners expect that this will be wiped out by the increased receipts.

Hydro Electric Power Commission of Ontario and Projected Electric Railways.

Meetings have been held at a large number of places throughout Western Ontario, at which resolutions have been passed favoring the construction of electric railways in connection with the Hydro Electric Power Commission of Ontario. The main object is to stimulate interest in the building of lines upon this public ownership plan. The Commission's engineers are investigating traffic possibilities throughout the whole territory, to ascertain what are the most likely points between which trunk lines should be built, and what local lines it will be necessary to build to give the best service to the territory between the trunk lines. It will be some time before anything definite comes of these investigations.

The first line suggested to be built to utilize power from the Commission is from Toronto to Markham, Port Perry and other points, which was fully described in Canadian Railway and Marine World for Nov., 1913. At a meeting of representatives of the various municipalities interested, in Toronto, June 10, it was arranged that the ratepayers will be asked to vote on Sept. 21 on the question of raising the necessary funds to build the line. F. A. Gaby, Chief Engineer of the Hydro Electric Commission, was present. The estimated cost of the line is \$3,954,914, distributed among the township, village and town municipalities as follows:—

Scarboro Tp., 10.4 miles	\$430,273.00
Agincourt	15,233.27
Markham Tp., 19.4 miles	700,600.00
Unionville	18,720.00
Markham Village	62,740.00
Mount Joy	17,945.45
Stouffville	75,829.42
Whitchurch Tp., 21.92 miles	497,710.00
Newmarket	272,700.00
Pickering Tp., 10.27 miles	417,600.00
Claremont	28,302.02
Whitby Tp., 14.2 miles	440,500.00
Whitby Town	179,532.00
Reach Tp., 9.8 miles	239,450.00
Port Perry	108,540.16
Uxbridge Tp., 11.56 miles	253,579.00
Uxbridge Town	180,677.82

Novel Electric Switching Locomotives have been placed in service on the Pennsylvania Rd. ore docks at Cleveland, Ohio, for handling cars. They do not operate on the same track as the cars they handle, but on a parallel 42 in. track. Each locomotive is equipped with an arm on each side, which can be lowered by means of compressed air, controlled from the cab, these arms acting as pushers to the cars on the adjoining standard gauge track. Single cars or trains can be handled equally well, and it has the especial advantage of facility in cutting out or shifting individual cars in a train with a minimum of shunting.

Motor Omnibusses for Winnipeg.—The Works and Property Committee of the Winnipeg City Council, June 4, recommended the passing of a bylaw granting a franchise to A. J. Andrews, K.C., and H. W. Adcock, representing the Winnipeg Omnibus Co., to operate motor busses on the streets. The agreement proposed to be made gives the company an exclusive franchise for five years. As soon as its terms are settled a bylaw confirming it will be submitted to the ratepayers.

Pitt River Bridge, Coquitlam, B.C.—A contract has been let to Armstrong, Morrison & Co., Vancouver, B.C., for the substructure of the bridge across the Pitt River at Coquitlam, B.C. The contract calls for the construction of seven open dredging caisson piers and two pile driven piers. The approach on the west end will be 300 ft. long, and that on the east end 465 ft.

Vancouver Board of Trade Endorses Increased Fares on British Columbia Electric Railway.

The British Columbia Electric Ry.'s action in increasing its fares in Vancouver to 5 cents has been considered by a special committee of the Vancouver Board of Trade, the majority of which presented the following report, which has been adopted by the Board:

We feel that any findings this board makes should be based on a fair analysis of conditions, as to the cost of labor, cost of material, and any other exigencies which enter into the development, equipment and maintenance of a passenger carrying system, such as that provided by the B. C. E. R. Co. Your committee held 10 meetings and has obtained information with respect to the cost of fares and areas served by such fares, from Montreal, Toronto, Winnipeg, Edmonton, Calgary, Seattle, Portland, San Francisco and Los Angeles. We have also obtained a great deal of information from officers of the B. C. E. R. Co., who have invariably treated the committee with courtesy.

Our finding is that the B. C. E. R. Co. was, under existing conditions, justified in raising its fares, but that as soon as the present high proportion of expense to earnings can be reduced, a reconsideration of the fares charged will be justifiable. We submit the following as some of the reasons for our finding: The money actually expended up to June 30, 1913, amounted to \$45,168,312, and the amount paid out in interest and dividends for the year was \$1,888,139, equal to 4.18% on the entire investment.

During the last 10 years the cost of equipment, supplies and wages has increased at least 25%. The wages paid by the B. C. E. R. Co. are about 10% higher than those paid in any other Pacific coast city, and from 20 to 25% higher than those paid in the cities of Eastern Canada. Conductors and motormen on the company's system receive 27c. an hour for the 1st year, increasing to 36½c. in the 5th year, while Seattle pays 25c. the 1st year, increasing to 32c. in 15 years; Portland pays 25c. for the 1st year, increasing to 31c. in the 6th year; San Francisco pays 25c. the first year, increasing to 33c. in the 9th year; Los Angeles pays 25c. the 1st year, increasing to 30c. in 5 years; Montreal pays 23c. the 1st year, increasing to 25c. the 3rd year and thereafter; Toronto pays 23½c. the 1st year, increasing to 27½c. the 3rd year and thereafter; Winnipeg pays 25c. the 1st year, increasing to 34c. in the 4th year. A similar comparison of the wages paid to trackmen, barnmen and mechanics, shows a corresponding increase paid by the B. C. E. R. Co. as compared with the above mentioned cities. There are about 800 conductors and motormen employed in Vancouver and on the suburban lines, working an average of 9 hours a day. These men receive 18c. more per day than paid in any other coast city. This amounts to \$52,560 in a year, and if we include the trackmen, barnmen and mechanics the amount would be more than doubled.

Equipment and supplies are about 15% higher in Vancouver than in other coast cities, and 10% higher than in Eastern Canadian cities. For example, a car costing \$7,407.80 at Vancouver can be purchased in Seattle for \$5,986.40, and in Toronto for \$6,522.25. The Electric Railway Journal of Oct. 25, 1913, showed the operating expense ratios of 40 of the leading electric railway systems of this continent. The average is 59.09%, and the B. C. E. R. Co. has the highest ratio, 75.03%. The figures given relate only to straight operating expenses and

do not include any charge for renewals, depreciation, taxes or accident reserve.

It has been put forward in a criticism of the B. C. E. R. Co. that other companies serve a greater area for the same fare than that railway, but we have considered that the area served by any railway is no indication of the service rendered to the public without taking into consideration the population, track mileage, and number of cars operated within that area. The North Vancouver service, with nearly 10 miles of trackage and a population of about 8,000, covers an area almost as large as the city of Vancouver with a population of 120,000 people, and 70 miles of trackage.

Another argument has been advanced in some quarters that owing to the policy of the company of contesting so many accident claims in court the expenses in connection with this department have been excessive. This statement has not been borne out by the facts, as the following figures will show: The total number of accident cases dealt with by the B. C. E. R. Co. from Jan. 1, 1911, to Feb. 20, 1914, was 1,420. Of these 66 were contested in court and 1,354 amicably settled without reference to law. This shows an average contested of less than 5%.

We asked the company to state to the committee the cost of power charged them and were informed that they could not answer specifically as to the charge per horse power or kw. hour, but submitted the following table showing the cost per car mile for the year ending June 30, 1913, as compared with the cost on other systems in Canada: B. C. E. R. 2.98c.; Montreal 2.62c.; Toronto 2.58c.; Winnipeg 2.81c.; Edmonton 11.22c.; Calgary 5.23c.

The revenue per car mile for four of the leading electric railway systems of Canada in 1912 shows Vancouver the least remunerative in that regard. Toronto provided \$42,846 a car mile; Montreal \$30,259; Winnipeg \$23,230, and Vancouver \$22,038.

We find further that with few exceptions the usual fare charged in the principal cities of the United States is 5c. In Canada the fare is usually about the same as that charged by the B. C. E. R. Co. previous to Sept., 1913. The straight 5c. fare is charged in nearly all the Pacific coast cities, including Seattle, San Francisco and Los Angeles. In Portland the fare is 5c. or 50 tickets for \$2.25. To the best of our knowledge the B. C. Electric Railway Company is the only company on the Pacific coast selling workmen's tickets at 4c. These are issued in 10 tickets for 40c., 5 white and 5 green, the white tickets being good from 5 to 8 a.m. and the green are good at all hours.

A good deal has been said about the distance that passengers are carried in other cities for one fare as compared with Vancouver. We think there is not much to complain of in this respect, as city passengers can travel from Alma Road and Tenth Ave. to Hastings St. and Boundary Ave., 8.35 miles, and settlers are carried from Dunbar St. and Wilson Road to Hastings St. and Boundary Ave., 11.78 miles, for 5c.

Notwithstanding the fact that the number of passengers carried has been steadily falling off from June last, the company is giving better service than ever, the number of car miles at present averaging about 90,000 a year more than in 1912. The growth of traffic in years previous to 1913 warranted liberal outlays in development and equipment, and consequent on these outlays the

operating expenses increased very considerably. In 1908 the rate of operating expenses of the railway department, exclusive of interest on outlay, was 71.09% of gross earnings; this ratio increased to 91% in 1913. In 1913 the gross earnings were 3½ times as much as in 1908, but the net earnings were the same as in 1908, notwithstanding the fact, as stated by the company, that three times the amount of capital was employed in 1913 as compared with 1908.

The total capital invested by the company has increased by about \$6,000,000 annually for the last five years, and now totals about \$45,000,000. Your committee has taken into consideration that the securing of capital for such undertakings as this is naturally dependent upon a fair return on the investment. The conditions which we find justify the increase in fares, call for and have resulted in strict economy in expenses and management, and it may be reasonably expected that in time these economies will reduce the present high proportion of operating expenses sufficiently to warrant a reconsideration of fares charged, but such reductions cannot be expected to greatly influence return on invested capital until passenger traffic increases.

The Proposed Abolition of Running Boards on Toronto Railway Cars.

The Ontario Railway and Municipal Board heard an application, June 9, by the Toronto Ry. employes' union regarding the abolition of the outside running board on open cars. On behalf of the applicants, it was urged that this had been done in U.S. cities, and the adoption of centre aisle cars was suggested. H. G. Osler, K.C., representing the Toronto Ry., made various suggestions for getting over the difficulty, and it was stated that a simple way to handle the business would be to use the winter cars all the year round, and have the windows dropped in the summer.

In giving the Board's decision on the matter, D. M. McIntyre, Chairman, said:—"It is apparent to anyone that the conductors are asked to perform their duties under conditions with a very imminent element of danger with the cars running at a high speed. We have not hesitated to legislate in connection with factories, and we should allow the men to suggest means of eliminating that danger." He also asked the Toronto Ry. to submit, by Sept. 24, plans of arrangement of car design, which would do away with the running board on the open cars.

When interviewed on the subject, later, the General Manager of the Toronto Ry. stated that the matter would be placed before the company's car designers, for a report and advice thereon.

Morrisburg and Ottawa Electric Ry.—L. on Sydow, Engineer in Charge, Union Bank Building, Ottawa, has invited tenders up to July 4, for supplying the right of way, complete construction and equipment of about 35 miles of line, commencing at or near Ottawa and extending to Chesterville, Ont., payment to be made in bonds or stock, or both, of the company. (May, pg. 231.)

Woodstock, Thames Valley and Ingersoll Electric Ry.—We are officially advised that J. G. Wallace, K.C., Woodstock, Ont., is in possession of the line, its property and franchises, as trustee for the bondholders, and not as receiver, as reported. The operation of the line is in charge of Ira Warfield, Superintendent.

An application made by W. J. Baird, on behalf of British interests, for a motor bus franchise in Vancouver, is under consideration by the city council.

Electric Railway Notes.

The Winnipeg City Council decided, June 9, to take steps to attempt to compel the Winnipeg Electric Ry. to give a faster service on Sundays.

The Edmonton Radial Ry., operated by the City of Edmonton, Alta., has received one single end, double truck city car from the Preston Car and Coach Co.

The Board of Railway Commissioners has dismissed the Town of Aylmer's application for a reduction in fare on the Hull Electric Ry., between Ottawa, Ont., and Aylmer, Que.

In a case under the Workmen's Compensation Act the St. John (N.B.) Ry. has been ordered to pay \$2,000 for the death of a lineman in its employ who was killed by coming in contact with a live wire.

The Brandon, Man., ratepayers voted, June 29, on a bylaw for the operation of cars on the municipal electric railway on Sundays. The result has not been received up to the time of going to press.

The Hull Electric Ry. has restricted smoking by passengers on its line to the last four seats on the Aylmer cars, and to the longitudinal seats on the C.P.R. local cars, provided that all the windows are open.

W. M. Charlton, Chairman of the Railway Committee, Brantford, Ont., received applications up to July 1 for the position of Manager of Brantford St. Ry., including the Grand Valley between Brantford and Galt.

An order is reported to have gone into effect June 17, under which the office of Allan Purvis, Manager, Interurban Lines, British Columbia Electric Rys., has been transferred from New Westminster to the general offices in the Carroll St. Building, Vancouver.

The Toronto Board of Control has decided to undertake the provision of about 20 motor busses for use in the outlying sections of the city. A bylaw is in course of preparation for submission to the ratepayers at an early date, for the provision of \$300,000 in this connection.

During the course of the mediation proceedings at Niagara Falls, Ont., in connection with the United States-Mexican affair, the International Ry. has considerably increased the number of cars operated between Buffalo and Niagara Falls, and across the bridge, on account of the largely increased traffic.

The Lethbridge Municipal Ry. is now being operated on the one-man system, with a view to economizing expenditure. Notice of the dismissal of all employes was given June 5, and they were invited to make application for reinstatement by June 12. A new wage schedule has been put in operation, coming into force June 19.

Judgment has been reserved by the Imperial Privy Council in the appeal of the British Columbia Electric Ry. against an order of the Board of Railway Commissioners directing it to pay part of the cost of certain bridges over streets in Vancouver. The company also disputes the power of the Commission to make such a direction.

The Brandon, Man., City Council decided, June 15 to ask the Public Utilities Commission to relieve it from providing a depreciation allowance in respect of the municipal railway for one year. The council pointed out that the line is a comparatively new one; the city is providing a sinking fund and the revenues from the line are at present small.

The Montreal City Council passed a resolution, June 8, approving of the safety first

campaign, started by the Montreal Tramways Co., and urging the citizens to cooperate in it. Superintendent Gaboury has addressed a letter explaining the movement to the various school authorities in Montreal and surrounding municipalities, and inviting co-operation.

The Montreal City Council, on June 8, took into consideration a suggestion to acquire the Mountain Incline Ry., so as to secure free transportation to the top of Mount Royal. The line is being operated under a contract, which terminates in 1922, and the city has power to expropriate. The City Attorney and the Civic Transportation Engineer were asked to report on the matter.

N. Cauchon, C. E., has written the Ottawa Citizen, advocating as a solution of the congestion and of the housing problems in Ottawa, the construction of a rapid transit line round the main part of the city, with a depressed line along the bed of the Rideau Canal. From this belt line radial lines could be built to all points. The project he suggests should be carried out as a national-civic undertaking.

The Niagara, St. Catharines and Toronto Ry. has received 6 double end, double truck, p.a.y.e. cars from the Preston Car and Coach Co. They are mounted on standard trucks with Canada Iron Corporation steel wheels. The electrical equipment is Canadian Westinghouse 101 B2 quadruple equipment with K28 control, and Westinghouse S.M.1 air brakes. The cars are 30 ft. 10 ins. long over corner posts, platforms 6½ ft. long, seats upholstered in rattan. They have Coleman stationary fareboxes, Keystone destination signs, pneumatic gong and pneumatic sander. The outside is painted a steel gray, which has been adopted as the Niagara, St. Catharines and Toronto Ry.'s standard color.

The Ontario West Shore Railway.—Representatives of the municipalities of the towns of Goderich and Kincardine, and the townships of Huron and Ashfield, held a joint meeting at Kintail, Ont., June 25, to consider the position in regard to the unfinished railway, of which they had guaranteed the bonds for various amounts respectively. Full details as to how matters stand, together with the report of the Ontario Railway and Municipal Board, were given in Canadian Railway and Marine World for June. After some discussion, it was decided to advertise the road for sale, with the condition that the municipal officers concerned would have the power to reject all offers for purchase, if the price and conditions were not up to expectations. It was also decided to commence proceedings for recovery of the money lost to the municipalities, and which had not been actually spent on construction, including amounts received on the sale of bonds and interest. The meeting passed a resolution urging on the Attorney-general of Ontario to prepare with all possible speed the necessary evidence for the extradition of J. W. Moves, on the charges against him, if extradition were found to be necessary, and also asking that the greatest possible effort be made to locate him. It was explained to the meeting that he had been traced to Scotia Jct., where all track of him was lost.

E. Bower, Travelling Passenger Agent, Canadian Northern Railway, Saskatoon, Sask., writes:—"Success to Canadian Railway and Marine World. It is full of useful data."

Central Railway and Engineering Club.—The seventh annual outing took place June 20, by special train from Toronto to Erin, Ont.

Interurban Cars for Toronto Suburban Railway.

The Toronto Suburban Railway has under consideration tendered for six double truck cars for its Lambton-Guelph extension, which is under construction. They are to be of the centre entrance type, with central partitions dividing the main part of the car from the smoking section. Three of the cars will be for passengers only, while the other three will have a small baggage compartment in the end of the smoking section, from which it will be taken, leaving the main part of the car the same in both cases. There will be emergency exits front and rear, but there will be no end bulkheads. They will have a seating capacity for about 70 passengers, and will approximate 55½ ft. long and 8½ ft wide. The underframing will in all probability be of steel, and it is possible that the whole car frame may be of steel construction. The body will be mounted on double trucks, and will have four 80 h.p. motors. The electrical equipment has been ordered from the Canadian General Electric Co.

The Snow Removal Problem on Street Railways.

Over 100 city officials, engineers, contractors and others who have to cope with the snow removal problem, met in Philadelphia, Pa., in response to an invitation from the Director of the Department of Public Works of Philadelphia, to participate in a snow removal conference.

M. Schreiber, Engineer of Maintenance of Way, Public Service Rys., Newark, N.J., explained the snow fighting organization of a street railway system of 865 miles of track. Before winter sets in the officers of all departments meet and agree upon a snow fighting campaign. Then all departments co-operate with a central organization which handles all the snow removal work. Mr. Schreiber brought out clearly that the success of the street railway forces was due to the compact and efficient organization, and he believed there was an opportunity for much greater co-operation between the city snow removal forces and those of the street railways.

The use of spreader plows for cleaning wide strips each side of the street car tracks was discussed and appeared to be feasible for the lighter snowfalls. These spreader plows have been used in Detroit and other cities for many years. M. R. Sherrerd, Chief Engineer, Board of Street and Water Commissioners, Newark, N.J., considered this a feasible way of opening streets and urged a closer co-operation between the cities and the street railway companies.

SIR ALBERT STANLEY, who was created a baronet on the King's birthday, is Manager, London Underground Ry., and though born in England, was, for a number of years, connected with the Detroit United Ry., and the Public Service Rys. of New Jersey.

SIR ADAM BECK, M.L.A., who was knighted on the King's birthday, is Chairman of the Hydro Electric Power Commission of Ontario, and is promoting the construction, by rural municipalities, of interurban electric railways under the Commission's control.

H. Powell, Section Foreman, Atlantic, Quebec and Western Ry., Barachois de Malbale, Que., in renewing his subscription, writes: "I should miss Canadian Railway & Marine World very very much."

Marine Department

The Standard of Construction for Great Lakes Vessels.

The London, Eng., correspondent of the Toronto Mail and Empire wrote recently as follows: "The heavy losses caused by the November storms on the Great Lakes still forms a subject of discussion in marine underwriting circles here, although the bulk of the liability has had to be borne by the American market owing to the refusal of Lloyd's and the British companies to accept the risks at low premiums. The hope is now expressed that as regards the classification of the steamers employed, the requirements of Lloyd's Register will be adopted as extensively as those for ocean-going vessels, some of the boats at present employed being, it is feared, lacking in longitudinal strength. In fact, the rules of Lloyd's for lake steamers were formulated after a careful investigation of the conditions under which they are usually employed, and it is believed that if they were more generally observed the disasters would not occur on such a large scale again. If not, it is likely that insurances will in future be difficult to effect, on this side at all events."

A Shipbuilder's Opinion.

In reference to the foregoing, J. M. Smith, Manager, Collingwood Shipbuilding Co., Collingwood, Ont., has written us as follows:—

"It is quite true that many of the ships built in the American shipyards on the Great Lakes are not built as strong as Lloyd's requirements call for. There are a number of ships, however, that are built quite as strongly as Lloyd's rules call for, and most of the latter are classed in the Great Lakes Register, which is an offspring of Bureau Veritas, which might be termed French Lloyd's. We have found that the requirements of the Great Lakes Register are very complete, and the given dimensions of materials are very intelligently worked out, and ships built to class in this register are quite up to any requirements of British Lloyd's. There are some ships built on the lakes that are classed in Lloyd's Register, they are good ships, but they are not any better nor any stronger than the ships that are classed in the Great Lakes Register. It would be much better in the long run for the shipowner if all ships were built equal to the requirements of some good classification society. I believe it is true that some of the ships that were lost may not have been built quite up to the requirements of such classification societies, but the majority of them were good ships. Some of the older ships may have been lacking in longitudinal strength, but I think that the most of the ships that have been built on the lakes in recent years are quite strong enough for the requirements of the service.

"The steamer Wexford, which was lost off Goderich, was built to class in Lloyd's Register, and although she was an old ship she had been repaired and rebuilt until she was a good sound ship. I believe that the Regina, which was lost at the same time, was built to class in the British Corporation. The James Carruthers, which was lost somewhere above Goderich, was built to the highest classification of the Great Lakes Register, and was, without doubt, the strongest built freight ship on the Great Lakes, and it was not want of strength that caused any of these three ships to founder. They were all fitted with good machinery, and had plenty of power, but, no doubt, they met a condition out on Lake Huron that could not be compared

with ordinary heavy gales, possibly they encountered something of the nature of a cyclone sweeping down the centre of the lake.

"The shipping trade on the Great Lakes has developed a distinct type of ship where large cargoes are carried on a moderate draught of water. The ships are built for a moderate price and are operated at a moderate cost, they are very suitable for the trade, no doubt, however, many little improvements will be added to them from time to time.

"I do not think that the ships that foundered in the storm last November were lost through carelessness on the part of the owners, or on the part of the officers or crews. My own belief is that they encountered an unusual storm, and the high winds, combined with an extremely violent snow storm and zero weather, made a combination that was almost impossible to contend with, and I think all of those ships would have reached port safely if they could have turned around and run before the storm, but, unfortunately, Lake Huron narrows down to about a quarter of a mile wide where it enters the St. Clair River at Port Huron and the waters are shoal for a good many miles before entering the river, and the ship masters knowing this would not dare to run for the river, and, no doubt, they turned to fight it out. Possibly the ships were thrown in the trough of the sea, and if so they would have little chance of recovery.

"We have built over 40 vessels here during the past 12 years, and they were all built equal to Lloyd's requirements. The most of them have been for service on the Great Lakes, and a few for service on the sea coast."

A Vessel Man's Opinion.

One of the best known men interested in the Great Lakes shipping business has written us as follows:—"There is nothing in the statement of the Mail and Empire's London correspondent. So far as I have heard, and I would be certain to hear of it, there has been no question raised yet by the underwriters in connection with the seaworthiness of lake steamers, either Canadian or United States, as they recognize that, with exceptional storms, there is always danger of ships being lost, and it is that risk which enables the underwriters to get business.

"Regarding the question of longitudinal strength, there has been no evidence so far that any of the ships which came to grief on the lakes in the storm of Nov. 9th were lost through lack of longitudinal strength. On the contrary, so far as I can learn, none of the ships failed in this respect while they were afloat, and any ships, when loaded, no matter how strongly they are built, are liable to break if thrown up on the rocks in a seaway, and bearing probably amidships with the two ends hanging, giving the same effect as bending a stick over your knee. Any evidence which has developed so far would indicate that the ships were more likely to have been lost from their hatches, or deck houses, or both, and the evidence would seem to be very strong on these two points, although nothing is known definitely, and never will be known probably, regarding the ships which foundered, but with those which were thrown up on the beach, these are the two points which suffered most.

"Regarding the classification of ships on the lakes, just as on the ocean, they are not classed exclusively by any one classification society. I believe there are eight United States lake freight vessels classed by Lloyd's Register, and it would be very difficult for Lloyd's, or anyone else, if not impossible, to show that any one of these is stronger as far as longitudinal strength is concerned than was the s.s. James Carruthers, which was classed by the Great Lakes Register of Cleveland, a classification society approved of and controlled by the U.S. underwriters. The majority of the vessels on the Great Lakes, especially those built in Britain, were classed by Lloyd's and British Corporation. The balance of the vessels on the lakes, I believe, are in the majority of cases classed by the Great Lakes Register of Cleveland. A great deal of nonsense has been written in connection with these losses by people who do not know what they are writing or talking about, and you can quite understand that Lloyd's are anxious to class all the vessels possible, as there is a fee in it for them, just as the wireless companies have been trying to make capital out of that storm and get more vessels to equip with wireless outfits, but, although I have asked the representatives of one of the wireless companies to give me the name of any ship which received any warning by her wireless of that storm of Nov. 9, and avoided the storm as a result of that warning, they have failed up to date to give me the name of any ship."

Welland Ship Canal Construction Contracts.

In Canadian Railway and Marine World for June, page 286, was given a list of the tenderers for the various sections on the Welland Canal, and in each section the name of the successful tenderer was shown in capital letters. This information was given by the acting Minister of Railways and Canals in response to questions in the House of Commons. In regard to sec. 3, it was noticed that there was a discrepancy as to the name of the successful tenderer, as compared with that previously announced and given in C. R. & M. W. for May, page 242. This was brought to the Department's attention, and we are officially advised that certain information which was supplied to the acting Minister was incorrect. The contract for sec. 3 was awarded to the lowest tenderers, O'Brien, Doheny, Quinlan and Robertson, Montreal.

The British Board of Trade has issued invitations to the various branches of the Imperial Merchant Service Guild, which represents about 75% of the total British captains and officers, to send representatives to a general conference with the Board of Trade authorities in London, Eng., on several suggestions for alterations to the International Regulations for Preventing Collisions at Sea. The suggestions cover the making compulsory of a second mast head light, a fixed stern light, a special signal for motor vessels proceeding under sail and mechanical power simultaneously, a suitable sound signal for a vessel in tow, and an addition to the distress signals by the inclusion of the radiotelegraph distress signal.

Rumors Concerning Canada Steamship Lines, Limited.

During the past few weeks a number of rumors concerning the position of Canada Steamship Lines, Ltd., have been freely circulated, and in this connection, Jas. Caruthers, President, has made the following statement,—“On account of erroneous, and in many cases, maliciously false reports, which have been circulated, I consider it my duty to the shareholders to lay the following facts before the public: To the assertion that Canada Steamship Lines, Ltd., owes the Bank of Montreal, the only bank with which it does business, \$1,250,000, I may say that the company does not owe the bank a cent. On the contrary it has a considerable amount to its credit there. Then I hear that there is a report to the effect that the company, while it got 6c. last year for transporting wheat is only getting 2½c. a bush. this year. The truth is that we have been getting from 4½ to 6½c. a bush. this year—a reduction from last year, it is true, but one offset by the fact that the company is enabled, by the greater size of some of the boats employed, in this trade, to transport not only much more economically than ever before, but with better dispatch at both ends.”

Regarding general receipts, the President said although it was impossible to forecast the future, the freight and passenger receipts are so far this year, ahead of those of the same period last year, and contracts for shipments have been made assuring satisfactory profits for a good part of the season. On the question of freight rates, he stated that the average rate received for grain last year was 5½c. a bush. for the whole season. During this season the rate commenced at 6½c., and it now is 4½c., and he announced that the company had booked at 5½c. for October. He also stated that all of the vessels in the company's service were in operation.

Stern Wheel Steamboats for the Saskatchewan River.

Canadian Railway and Marine World for June contained some reference to the two steamboats which the Saskatchewan Steamship and Coal Co. has arranged to operate on the Saskatchewan River, between Prince Albert and North Battleford, Sask., and Edmonton, Alta. The hulls are being built at Prince Albert, and the machinery is being supplied from Chicago, Ill.

The vessels will be about 140 ft. long by 35 ft. beam, but full details have not been settled, and some changes may be made. The engines will be of the direct acting type, each cylinder being 14 ins. diam. by 60 ins. stroke, with double steam chest and ring fitted piston valves. The cylinders will be adjustable, on mild steel bedplates, being arranged for lining up. The wheel shaft will be of forged steel 7¾ ins. hexagon, built to conform to Canadian regulations, and fitted with forged steel cranks hammered out of the solid; crank pins forged steel and in proportion to the wheel shaft; wheel shaft fitted with four steel flanges for a 16-arm paddle wheel; crossheads of steel fitted with bronze gib adjustable both top and bottom; eccentric rods of extra heavy gauge tube and wood filled; connecting rods wood filled, with forged steel straps held in place by through bolts; connecting rods fitted with strap and key takeup boxes; the fittings for the engines will include marine lever throttle valve, sight feed lubricators, cylinder drain valves, grease cups, oil cups, etc., and the

engines will be operated by Stephenson link, and latch handle locomotive reverse lever working in double quadrant with cut-off notches indicated. The boilers will be of the horizontal return flue, internally fired, Clyde marine type, 6½ ft. diam. by 11 ft. long, each containing 94 tubes 3 ins. diam. fitted with Morison furnaces 40 ins. diam. outside, with steam dome 40 ins. diam. by 36 ins. high. The boilers are built according to the Canadian regulations for a working pressure of 175 lbs. The feed water pumps are 6 by 4 by 6 with auto positive injectors, fire pump 6 by 4 by 6, of the ram type. The exhaust steam passes through a feed water heater consisting of a double galvanized spiral pipe casing with iron pipe coil. The vessels will be equipped with double drum steam capstan fitted to the forward deck, operated by double 5 by 7 engines, and driven by all steel gears. The electric equipment will include a 100 light generating set, the dynamo being direct connected to a 6 by 5 engine; and a 15 ins. searchlight fitted with mirrors will be fitted and controlled from the pilot house. The steering wheel will be 7 ft. diam., of hardwood, with connections for three rudders.

The Keystone Transportation Company's s.s. Keynor.

The s.s. Keynor, which has been built for the Keystone Transportation Co., Ltd., Montreal, by the North of Ireland Shipbuilding Co., Ltd., at Londonderry, Ireland, recently, has the following dimensions:—Length h.p. 250 ft.; breadth extreme 42½ ft.; moulded depth 20 ft. She has a corresponding draught in fresh water of 14 ft., and a deadweight carrying capacity of about 2,300 tons.

She has been built to Lloyd's highest class for service on the St. Lawrence River and Great Lakes. Her machinery consists of triple expansion engines supplied with steam from two single ended boilers, fitted with Howden's forced draught. She has 4 special stern winches and a complete outfit of derricks, etc., for dealing with cargo, also powerful steam windlass, a steam steering gear, electric light throughout, the navigation lights, compasses and telegraphs being electrically lit.

Very complete accommodation for the owners as well as state rooms and rooms for officers and deck hands is provided in the fore-castle, with the captain's accommodation in a house on the deck above, the pilot house for navigating purposes being on top of the captain's quarters. The dining room, kitchen, pantry, cold store, engineers' rooms and excellent accommodation for firemen, etc., are in a large deck house at the after end of the vessel.

The Keynor sailed from Londonderry June 6, for Sweden, to load wood pulp, after which she left for Montreal, where she is expected about the middle of July. She is a sister vessel of the Keyvive, owned by the same company.

The Sault Ste. Marie and the Suez Canals Compared.—In the last issue of Canadian Railway and Marine World was given some figures comparing the traffic through the Sault Ste. Marie Canal with that passing through the Suez Canal. The figures relating to the Sault Canal were those for 1912, and related to the United States Canal only. The total number of vessel passages through both the Canadian and U.S. canals for 1912 was 22,778, with a registered tonnage of 56,736,807, and for 1913, 23,795 total vessel passages with a registered tonnage of 57,989,715.

Another Projected Merger in Great Lakes Navigation.

A navigation company, which will probably be named the Gulf and Lake Navigation Co., is said to be in process of formation in Toronto, and in this connection, negotiations are reported to be proceeding with the Farrar Transportation Co., for the acquisition of its property. It is reported that the Farrar Transportation Co.'s shareholders have been offered \$125,000 in cash, \$25,000 in 7% cumulative preferred stock, and \$125,000 of common stock in the new company. This would work out at approximately \$62, one share of preferred and half a share of common stock, for each share now held. It is also reported that the new company will issue bonds to the extent of 50% of the appraised physical assets, with preferred stock and common stock issues of similar amounts respectively. It is stated that an elevator has been acquired at Kingston, Ont., and docks at Oswego, N. Y., near the outlet of the Erie Canal, for the purpose of routing grain to New York.

J. W. Norcross, Managing Director, Canada Steamship Lines, Ltd., was mentioned as being concerned in the matter, together with some U. S. interests, but is reported to have stated that he had no interest in it, and that the new company would have no connection, either directly or indirectly, with Canada Steamship Lines, Ltd.

The Farrar Transportation Co. owns the steamships Collingwood and Meaford, valued in its last balance sheet at \$408,409.03, and at Dec. 31, 1913, showed total assets of \$496,454.85, with an excess of assets over liabilities of \$163,976.63. The gross earnings for the year were \$166,620.33, with a net profit of \$62,778.37. There was a bonded indebtedness of \$81,000 on the s. s. Collingwood, and there was an amount on hand to take care of the interest and principal payments on this for the next three years. The intrinsic value of the shares at the close of the year, was placed at \$165.55 each. A dividend of 10% with a bonus of 5%, was paid for 1913. The officers are,—President, T. I. Thompson, Owen Sound, Ont.; Vice President, E. R. Wayland, Fort William, Ont.; Secretary-Treasurer and Managing Director, G. E. Fair, Toronto; other directors, E. Stubbs, Sault Ste. Marie, Ont.; D. D. Lewis, Lorain, Ohio; W. E. Allen, Toronto; M. Snetsinger, Thornbury, Ont.; G. P. Pearsall, Collingwood, Ont.; and C. I. de Sola, Montreal.

The Cunard Steamship Co's report for 1913 shows that, including £88,964 8s. 0d. brought forward from 1912, the profits were £1,276,795 0s. 10d. After debiting income tax and debenture interest and reserving £443,637 4s. 9d. for depreciation, there is at the credit of profit and loss account, £710,364 17s. 4d. Of this, £300,000 has been placed to repair and renewal fund, £57,735 to insurance fund, and £100,000 to reserve fund. A dividend of 5% has been paid on the preference stock, amounting to £59,735 to insurance fund, and £100,000 to declared on the ordinary shares, leaving £130,377 17s. 4d. to be carried forward to the current year's accounts. The report states that the steamships Andania and Alaunia were received from the builders, July 1 and Nov 13 respectively, and were placed in service on the Canadian route. A contract has been placed at Wallsend on Tyne, Eng., for the construction of another passenger and cargo steamship, to be named Aurania, for the London-Canada service.

The name of the steamboat Clyde, purchased from foreigners, has been changed to Stanstead.

The Wreck of the C.P.R. s.s. Empress of Ireland.

The s.s. Empress of Ireland, which was sunk in collision off Father Point, in the St. Lawrence River, May 29, with the s.s. Storstad, under charter to the Dominion Coal Co., was built at Glasgow, Scotland, in 1906. She was divided into 10 watertight compartments by bulkheads. Three decks surmounted the main structure of the hull, forming capacity for the accommodation of passengers, and giving the vessel a high appearance from the water line, and a big distance from the load waterline to the upper deck. The shortened decks of the upper structure were carried to a greater length than usual with this type of vessel, giving larger space in the saloons and recreation rooms. She was a three deck shelter deck vessel with promenade deck, upper promenade deck, and boat deck above, built to Lloyd's highest class. There was a cellular double bottom, fore and aft, capable of carrying 1,000 tons of water ballast, and in addition 1,900 tons were carried in deep tanks. She was steered by a balanced rudder operated by two steering engines on the telemotor principle, the gear being under water to meet the British Admiralty's requirements, to be approached either from above deck or from the shaft tunnels. For the safe navigation of the vessel and the accommodation of those responsible for it, every possible provision had been made. From three positions on the bridge, and two aft, the vessel could be steered, and the engine room bulkhead, steering and deck telegraphs and telephones were fully and conveniently installed. For the accommodation of the captain and deck officers, excellent quarters were provided in a steel house on the navigating bridge. Above the latter was the upper navigating bridge with the usual steering wheel, compass and searchlight. The propelling machinery consisted of quadruple expansion engines balanced on the Yarrow

Schlick and Tweedy system to reduce vibration to a minimum, with an indicated horse power of 18,500, for a speed of 20 knots an hour. There was a full equipment of wireless telegraph and submarine apparatus, and more than ample lifeboat and life saving appliances. There was capacity for 10,000 tons dead weight cargo, and 4,000 tons of coal. Her dimensions were: length 548.9 ft., breadth 65.7 ft., depth 36.7 ft.; registered tonnage 14,191. There was accommodation for 432 first, 328 second, and 846 third class passengers.

In order to meet the special requirements of the case, special legislation was passed by the Dominion Parliament to enable a special board to be appointed to enquire into the circumstances of the disaster, and subsequently a board was appointed consisting of Lord Mersey, as Chairman; Chief Justice McLeod, of New Brunswick; and Sir Adolphe Routhier, of the Quebec Admiralty Court, with Capt. L. A. Demers, Dominion Wreck Commissioner; Commander Howe, of the Dominion Naval Department; Prof. John Welch, Naval Architect, Newcastle upon Tyne, Eng.; and F. W. Caborne, of the Royal Naval Reserve, as nautical assessors. The enquiry commenced at Quebec, June 16, and a large amount of evidence from all sides has been collected, on the main points of which there was considerable contradiction. Some diving operations have been undertaken, chiefly with the view of obtaining information regarding the position and condition of the wreck, and such operations are being continued, though it is realized that the task is a dangerous one, one diver having lost his life during the operations.

Capt. Donald, of the G.T. Pacific Coast Steamship Co.'s s.s. Prince George, was presented with a testimonial recently in recognition of his rescue of 38 passengers of a gasoline boat which was swamped during a storm along the northwest coast of British Columbia.

Atlantic and Pacific Ocean Marine.

Capt. Murray, R.N.R., has been appointed to the command of the C.P.R. s.s. Tyrolea, vice Capt. Carey retired.

The Allan Line s.s. Virginian has been chartered by the C.P.R. to take up the sailings of the s.s. Empress of Ireland, wrecked in the St. Lawrence, recently.

The C.P.R. steamship service between Canada and Trieste, Austria, having been discontinued, the steamships Tyrolea and Ruthenia will, during the current season, be run between Montreal and London.

Holt and Co., owners of the Blue Funnel Line, running to Vancouver and Victoria, B.C., are reported to have stated that it will be some time before their vessels will make Prince Rupert a port of call.

An order in council has been passed amending Montreal pilotage bylaw 45, by adding the following,—“For the pilotage of any vessel subject to pilotage, between Montreal and Quebec and vice versa, a minimum fee shall be charged of \$20.”

The Canada Line's s.s. Gothland ran on the rocks during a fog, off the Scilly Isles, England, June 24, and is believed to be a total wreck, as she grounded at high water in heavy weather. The whole of the passengers and crew were safely removed.

The C.P.R. Missanabie was launched at Glasgow, Scotland, June 22, the christening ceremony being performed by Mrs. G. McLaren Brown, wife of the European Manager, C.P.R., London. The Missanabie is for the Atlantic service, and will have accommodation for 520 second and 1,200 third class passengers.

Canadian Northern Steamships s.s. Royal Edward, while bound from Montreal to Avonmouth, towards the end of May, struck an iceberg about 110 miles east of Cape Race, while going dead slow during a fog. It was not considered that the damage was such as to prevent her from continuing her

List of Steam Vessels Registered in Canada During May, 1914.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner	
134136	Aviso	Quebec, Que.	Sorel, Que.	1914	54 7	14 6	7 0	52	22	13n.h.p. sc.	John Reid, Montreal.
136047	Galiano	Ottawa	Dublin, Ireland	1913	162 3	27 1	13 1	893	129	161 "	Minister of Naval Service, Ottawa, Ont.
134561	Glenlivet (a)	Midland, Ont.	Cleveland, Ohio	1891	266 0	33 0	20 0	1890	1089	111 "	Great Lakes Transportation Co., Midland, Ont.
129159	Gwennith	Ottawa, Ont.	Alphen-on-Rhine, Holl'd	1910	85 4	18 1	9 1	119	3	50 "	T. F. Maltby, 79 Mark Lane, London, Eng.
116815	Harry E. Packer	Cobourg, Ont.	Cleveland, Ohio	1882	227 6	35 4	17 1	1183	810	99 "	G. Plunkett, Cobourg, Ont.
135209	Imperoyal	Sarnia, Ont.	Grangemouth, Eng.	1913	249 5	43 1	19 7	2253	1384	157 "	Imperial Oil Co., Sarnia, Ont.
134827	J. W. Brankley	Chatham, N.B.	Chatham, N.B.	1914	64 0	16 0	7 0	61	19	16 "	F. M. Tweedie, Chatham, N.B.
122615	Marlton	Goderich, Ont.	Goderich, Ont.	1914	62 0	16 0	8 8	64	43	24 "	W. Marlton and W. L. Horton, Goderich, Ont.
130888	Pelee	Amherstburg, Ont.	Collingwood, Ont.	1914	146 0	24 1	9 9	538	243	58 "	Windsor and Pelee Island Steamship Co., Pelee Island, Ont.
134135	Puncher	Quebec, Que.	Sorel, Que.	1914	54 7	14 6	7 0	52	23	13 "	John Reid, Montreal.
134134	Sir Lomer	Quebec, Que.	Portneuf, Que.	1912	59 5	15 4	7 0	48	18	23 "	J. A. Lemay, Portneuf, Que.
134347	Stanstead (b)	Montreal	West Bay City, Mich.	1881	252 5	36 4	19 5	1540	970	98 "	F. E. Hall, Montreal.
129767	Toiler	Kingston, Ont.	Newcastle-on-Tyne, Eng.	1910	243 2	42 5	17 3	1659	1334	70 "	James Playfair, Midland, Ont.
134196	Velma M.	Sault Ste. Marie	Buffalo, N.Y.	1872	57 0	11 0	6 0	31	13	10 "	W. Lowery, M.O., Sault Ste. Marie, Ont.
134015	W. Grant	Morden	Port Arthur, Ont.	1914	674 0	59 2	27 8	8973	6595	210 "	Canadian Steamship Lines, Ltd., Montreal.
91255	William Ioliffe (c)	Victoria, B.C.	South Shields, Eng.	1885	149 0	26 2	14 0	332	58	150 "	Canadian Pacific Railway, Montreal.

(a) Formerly Wawatam. (b) Formerly Cayuga. (c) Since changed to Nitinat.

List of Sailing Vessels and Barges Registered in Canada During May, 1914.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner	
134213	Amy, Turner	Prince Rupert	Bk.	Boston, Mass.	1877	174 0	35 4	21 6	901	Granby Consolidated Mining, Smelting & Power Co., Vancouver, B.C.
134348	C.P.R. No. 100 (a)	Montreal	Barge	Farmingdale, Me.	1868	197 0	37 8	24 8	1237	Canadian Pacific Railway, Montreal
134088	Copper Queen	Vancouver, B.C.	Scow	Seattle, Wash.	1914	56 8	22 5	10 4	106	Granby Con. Min. & Smelt. Co., Grand Forks, B.C.
134089	Drill Boat Burrard	Vancouver	Scow	North Vancouver	1914	115 0	30 0	7 8	428	Dominion Contracting Co., Vancouver, B.C.
78858	Dunure	Sydney, N.S.	Bktn.	Troon, Scotland	1881	112 0	22 9	11 8	176	A. E. Hickman, St. John's, Nfld.
134344	Edgar B.	Montreal	Scow	Cardinal, Ont.	1905	75 2	20 5	4 2	168	General Contracting Co., Montreal.
133750	George A. Marsh	Toronto	Schr.	Michigan City	1882	132 0	26 0	8 5	220	J. J. B. Flint, Belleville, Ont.
134197	L. S. No. 31	Sault Ste. Marie	Scow	Cleveland, Ohio	1876	105 0	28 0	8 0	377	S. L. Penhorwood, Sault Ste. Marie, Ont.
134182	N. G. & C. No. 3 (b)	St. John, N.B.	Dredge	Perth Amboy, N.J.	1894	120 6	55 3	8 6	1088	Norton Griffiths & Co., Ltd., Montreal.
134342	Norah L.	Montreal	Scow	Montreal	1898	79 0	22 7	5 3	188	Quinlan & Robertson, Ltd., Montreal.
133749	R. M. & S. No. 14	Toronto	Scow	Toronto	1914	100 0	35 0	6 8	195	Roger Miller & Sons, Ltd., Toronto.

(a) Formerly Two Brothers. (b) Formerly No. 3.

voyage, which was completed in safety On arrival at Avonmouth she was docked for repairs, and her next sailing cancelled.

Capt. Carey, commander of the C.P.R. s.s. Tyrolea, has retired from active service, after 51 years service at sea. He commanded the C.P.R. s.s. Empress of Ireland, wrecked recently, during her first year of service, but was transferred back to the Tyrolea, then the Lake Erie, at his own request.

The Roth Line s.s. Coningsby, from Antwerp and Dundee to Montreal, put into St. John's, Nfld., on her way over, having sprung a leak in mid ocean. It was found that the stern glands were leaking badly. The damage was repaired and the vessel proceeded to Montreal, arriving there June 12.

The Marine Department announces that it has placed a green buoy showing oscillating white light, in 25 fathoms, about half a cable north of the wrecked s.s. Empress of Ireland; bearing from the buoy to Father Point light, south 54 deg., west distant 7 miles; vessel apparently lying on its side, least sounding 9½ fathoms low water.

The Norddeutscher Lloyd s.s. Hanover, which is being operated by the Canada Line, a subsidiary company, and which was at first reported to have collided with the s.s. Empress of Ireland, arrived at Montreal, May 31, inaugurating the second class passenger service for the company, between Montreal and continental ports in Europe. She is about 450 ft. long, 56 ft. draught, 6,000 tons register, and previously ran to Baltimore, Md. She has accommodation for 1,525 passengers.

On account of the close working arrangement between the C.P.R. and the Allan Line, it was reported from England that the latter's offices in Liverpool, were to be closed, during June, and the staff accommodated in the C.P.R. offices there. G. M. Bosworth, Vice President, C.P.R., was in England during June, when it was stated he dealt with the matter. The constantly recurring reports as to the absorption of the Allan Line by the C.P.R. have been previously dealt with in Canadian Railway and Marine World.

Maritime Provinces and Newfoundland.

The Dominion Government has included in the estimates for this year \$20,000 for dredging in Charlottetown harbor, P.E.I.

Work on the ferry wharf at Cardigan, P.E.I., for which \$10,000 was recently appropriated by the Dominion Parliament, consists of the reconstruction of the present wharf, 315 ft. long, an extension of 40 ft. pier head 70 ft., and guide piers 90 ft.

Following are the officers and directors of the Miramichi Steam Navigation Co. for the current year,—President, Hon. J. P. Eurchill; Vice President, J. D. Creaghan; other directors, R. Murray, John McDonald, W. B. Snowball, R. A. Snowball and J. D. B. F. McKenzie; Secretary-Treasurer and Manager, H. B. McDonald.

In connection with the recent revote in the Dominion Parliament of \$24,000 for the construction of two piers at North Lake, P.E.I., the Minister of Public Works stated that delay had occurred in the carrying out of the work owing to the local farmers declining to grant the Government the usual releases from claims for possible damage to land.

Two steamships, especially built and equipped for the coal trade, have been ordered in Sunderland, Eng., for charter, under a 10 year agreement, to the Dominion

Coal Co. They will be of the single deck type and built on the Isherwood system, with wing ballast tanks. Their dimensions will be, length 450 ft., breadth 58 ft., depth, moulded 33½ ft., and they will carry 11,000 tons on a 25 ft. draught.

The Marine Department announces that while the work on the extension of the Souris East breakwater, P.E.I., is in progress the portable light lantern on a pole at the outer end of the new work is liable to be extinguished or carried away by heavy seas, thus leaving the new work unguarded. All care will be taken to keep a continuous light, but mariners are cautioned to use care in entering at night.

The Dominion Government lightship 13, intended for service at Halifax, N.S., which was wrecked recently off the mouth of Liscomb harbor, about 120 miles east of Halifax, was built at Paisley, Scotland, and left the Clyde, Apr. 29, arriving at St. John's, Nfld., May 17, for coal. She left St. John's, May 19, and was expected to arrive at Halifax, May 22. None of the crew of 22 appears to have been saved, and little, if any knowledge, has been obtained as to the loss, which falls on the builders, who contracted to deliver the vessel at Halifax. She was built of steel throughout, classed 100 A1 at Lloyd's, and was of the following dimensions:—length over all, 135 ft. 9 ins.; length on water line, 114 ft.; beam moulded, 29 ft.; depth moulded, 14 ft. 8 ins.; draught, 12 ft. 9 ins.

At the usual monthly meeting of the St. John Board of Trade, June 1, the Secretary reported on the recent visit of C.P.R. officials to the port, and mentioned requests made by them as to betterment of accommodation there. They asked that the C.P.R. be allotted berths 2, 3 and 6, with 1, and its extension down the harbor, numbered 15, that the city keep all craft clear of the fairway approaching these wharves, and that the potato sheds on the so called C.P.R. wharves be made in fit condition for cargo, that the berths at West St. John be sounded for depths and a report sent to the C.P.R. Marine Superintendent at Montreal, that no craft be placed on the angle facing between berths 6 and 7 so that they may be kept clear at all times, and that all harbor tolls and other charges be made equivalent to those made at Halifax.

Province of Quebec Marine.

The curator of the Northern Transport Co., Montreal, insolvent, declared a first and final dividend recently, payable June 22.

J. B. E. Letellier, one of the Quebec Harbor Commissioners, is suing the Montreal Star for \$10,000 damages for alleged libel, in connection with the purchase of ties, etc., for the Commission.

Capt. T. Bourassa, heretofore assistant harbor master, has been appointed harbor master, Montreal, vice Capt. L. A. Demers, reappointed Dominion Wreck Commissioner.

It is reported that during July a self contained grain barge will arrive at Quebec from Great Britain, for use in the harbor in loading grain on regular ocean going passenger vessels, without necessitating them leaving their berths.

The Quebec Harbor Commission dredge 551, which has been built in Great Britain, arrived at Quebec, June 12, having crossed the ocean under her own steam. The dredge is of the bucket type and is capable of removing 1,000 tons of material an hour.

From the commencement of navigation to June 16, 16,790,961 bush. of grain were received in store at the Montreal Harbor Commissioners' elevators. Of this about 14,000,000 bush. arrived by the water route and the balance by rail.

Capt. T. Bourassa, heretofore deputy harbor master, has been appointed harbor master, at Montreal, vice Capt. L. A. Demers, reappointed Dominion Wreck Commissioner. Capt. Symons, Lieutenant R. N. R., has been appointed deputy harbor master.

Canada Steamship Lines' new ferry steamboat for the Montreal-Longueuil service is expected to be ready for service towards the end of July. She is an iron vessel, 170 ft. long and 43 ft. broad over guards. She will have passenger accommodation for about 1,000.

Canada Steamship Lines s.s. Berthier was burned, and sank at her moorings alongside Victoria Pier, Montreal, May 25. She was built at Sorel, Que., in 1870, and was paddle wheel driven by engine of 43 n.h.p. Her dimensions were, length 184.2 ft.,

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during May.

ARTICLES	CANADIAN CANAL	U. S. CANAL	TOTAL
Copper..... Eastbound	Short tons 423	7,872	8,295
Grain..... " "	Bushels 7,816,880	5,307,940	13,124,820
Building stone..... " "	Short tons 216,850	1,044,552	1,260,902
Flour..... " "	Barrels 2,681,365	1,104,219	3,785,584
Iron ore..... " "	Short tons 2,200	2,128	4,328
Pig iron..... " "	" 2,439	67,926	70,365
Lumber..... " "	M. ft. b.m.		
Silver ore..... " "	Short tons 21,179,416	5,579,117	26,758,533
Wheat..... " "	Bushels 10,890	38,852	49,742
General merchandise..... " "	Short tons 427	500	927
Passengers..... " "	Number		
Coal, hard..... Westbound	Short tons 59,641	189,053	248,694
Coal, soft..... " "	" 362,680	1,540,745	1,903,425
Flour..... " "	Barrels 367		367
Grain..... " "	Bushels 8,796	43,406	52,172
Manufactured iron..... " "	Short tons		
Iron ore..... " "	"		
Salt..... " "	Barrels 29,064	200,845	229,909
General merchandise..... " "	Short tons 50,836	99,518	150,354
Passengers..... " "	Number 748	313	1,061
Summary.			
Vessel passages.....	Number 943	1,684	2,627
Registered tonnage.....	Net 2,467,707	3,288,196	5,755,903
Freight—Eastbound.....	Short tons 3,453,966	1,045,191	5,099,157
—Westbound.....	" 486,075	1,902,884	2,888,959
Total freight.....	" 3,940,041	3,548,075	7,488,116

breadth 28.1 ft., depth 8.6 ft.; tonnage, 934 gross, 439 register.

Atlas Shipping Co., Ltd., has been incorporated under the Dominion Companies Act, with \$250,000 capital, and office at Montreal, to own and operate steam and other vessels, and to carry on a general navigation business throughout the Dominion and elsewhere. The incorporators are, E. E. Howard, J. DeWitt, H. C. McNeil, W. H. Howard, Montreal, and O. S. Tynedale, Westmount, Que.

The s.s. Rhoda, owned in Montreal, which was being operated between Montreal and La Prairie, is aground about a mile below La Prairie. At the time of writing, no effort was being made to release her. She was built at Levis, Que., in 1874, and is paddle wheel driven by engine of 34 n.h.p. Her dimensions are, length 131.5 ft., breadth 23 ft., depth 10 ft.; tonnage, 310 gross, 167 register.

The Public Works Department has completed dredging in the Ottawa River, from about half a mile above Green Creek to about a quarter of a mile below Kettle Island, in order to obtain a depth of 12 ft. at ordinary low water, with a minimum width of 205 ft. The dredged portion of the channel is aligned between a beacon on the south shore above Green Creek and a beacon on the lower extremity of Kettle Island.

Davie Shipbuilding and Repairing Co., Ltd., has been incorporated under the Dominion Companies Act, with \$500,000 capital and office at Lauzon, Que., to take over the business of G. T. Davie and Son, Lauzon, Que., and to continue and extend same as a general ship building and repairing business. The incorporators are, G. D. Davie, A. C. Davie, Lauzon, Que., T. A. O'Neill, J. P. A. Gravel and A. C. M. Thompson, Quebec, Que.

The new elevator at Quebec, controlled by the Harbor Commissioners, was put into service June 9, when the Quebec Transportation and Forwarding Co.'s barge Zapotic discharged its cargo of 85,000 bush., taken from Port Colborne. The elevator has two marine legs, each capable of discharging 15,000 bush. an hour. The Harbor Commissioners are erecting a new conveyor system to connect the old elevator with the Louise dock.

The report called for by the Montreal Board of Control, respecting the proposed municipal ferry service to St. Helens Island, recommends the construction of three steel, fireproof ferry boats, costing about \$60,000 each, the building of three landing places on the Montreal side, one at the foot of McGill St., one opposite the centre of the city at the present landing place, and the third in the east end. The contract for the present service expires this year.

The Montreal Board of Control has been advised to drop its appeal in connection with the taxation of the Montreal Harbor Commissioners' property, on the ground that it is Government property, and therefore not taxable by the municipality. A bill has recently been passed declaring that the property vested in the Commission is to be deemed Government property, and that it always has been so, and authorizing the Commissioners to transfer same to the Government formally.

The Montreal Harbor Commissioners Act has been amended by providing that notwithstanding anything in that act, or any other act respecting the Montreal Harbor Commissioners, the harbor of Montreal and all property connected therewith, is vested in the Dominion Government, and shall be deemed always to have been so since July

1, 1867, and the Commissioners are empowered to transfer such property to the Government, such transfer, however, not to affect the Commissioners' jurisdiction.

Ontario and the Great Lakes.

The Chatham Navigation Co. has appointed T. J. Stockwell as captain, and E. P. Williams, as chief engineer, of its s.s. Ossifrage.

The name of the s.s. Prince Rupert, registered at Kingston, Ont., official number 124260, under the name of the Kingston Shipping Co., has been changed to Northmount.

The Department of Railways and Canals received tenders to June 26 for the construction of a stone protection on the summit level on the Welland Ship Canal, between Thorold and Port Colborne.

The dredge Delver, owned by the Dominion Dredging Co., contractors for section 1 of the Welland Ship Canal, capsized in a heavy sea near Port Dalhousie, June 15, and sank. Nine of the crew of ten were rescued.

The Pere Marquette Rd. car ferry steamer Marquette and Bessemer no. 2, which was lost in a storm on Lake Erie, in Nov., 1911, has been discovered about 10 miles south of Erieau. It is said that an attempt will be made to raise her.

The Department of Railways and Canals received tenders to June 18, for the construction of sec. 3, Seven Division, Trent Valley Canal. The section lies between Peterboro and Lake Simcoe. It is estimated that the cost will approximate \$1,500,000.

Canada Steamship Lines, Ltd., has purchased Grimsby Beach Park, between Hamilton and St. Catharines, Ont., for, it is said, \$130,000. A pleasure park will be operated in conjunction with a line of steamboats from the chief centres in the vicinity.

D. J. Bourke has been appointed Traffic Manager, Great Lakes Transportation Co., Windsor, Ont. This is the company recently formed, in which J. Playfair, Midland, and H. W. Richardson, Kingston, are chiefly interested, and of which the former is President.

The Rainy River Navigation Co. commenced its season on the Rainy River and the Lake of the Woods, June 16, with the steamships Keenora and Agwinde. The service will be tri-weekly, with calling places at Kenora, Warroad, Rainy River and Fort Frances.

The Canadian Sand and Gravel Co., Ltd., has been incorporated under the Ontario Companies Act, with \$100,000 capital and office at Thorold, to deal in sand and gravel, and to own and operate steam and other vessels. The provisional directors are: J. Battle, W. M. German, M. Battle, D. B. Page and C. Freil, Thorold, Ont.

The Mathews Steamship Co.'s s.s. Steelton arrived at Toronto, from England, during June. She is a sister vessel of the company's steamships Easton and Yorkton, and will be engaged in the Upper Lakes service. She was built at Sunderland, and on her recent trials made 11½ knots an hour. She is of full Welland Canal size, with double bottom, and is rated 100 A1 at Lloyd's.

The U. S. Lake Survey s.s. Surveyor, engaged in surveys and examinations in the east end of Lake Ontario, recently reported the discovery of a small rock shoal with least depth of 16 ft., about 4 11-16 miles from Stony Point lighthouse, and 4 miles from Galloo Island lighthouse. It is about 4,500 ft. south and 400 ft. west of Calf Island

Spit black can buoy, and is nearly on the sailing course between Charlotte and Sackett's Harbor. At extreme low water, the depth of water is only 12 ft.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for May, as follows,—Superior 602.33; Michigan and Huron 580.32; Erie 572.91; Ontario 256.95. As compared with the average May levels for the past ten years, Superior was 0.35 ft. above; Michigan and Huron 0.46 ft. below; Erie 0.06 ft. above, and Ontario 0.02 ft. below. It was anticipated that during June, Superior, Michigan and Huron would rise 0.3 ft., and Erie and Ontario 0.2 ft.

The St. Lawrence and Chicago Steam Navigation Co.'s s.s. J. H. G. Hagarty, which has been built at Collingwood to replace the s.s. James Carruthers, lost in the great storm on the lakes towards the end of last year, was launched June 18. She is practically the same as the lost vessel in construction. She is 550 ft. long, 58 ft. broad and 31 ft. deep, with hatches spaced 24 ft. apart instead of 12 ft. as on the James Carruthers. It is expected that she will be ready for her maiden trip about July 8.

The Algoma Central Steamship Line is reported to have purchased the s.s. E. D. Carter, from E. D. Carter, Erie, Pa. She is a steel vessel built at Wyandotte, Mich., in 1906, of the following dimensions,—length 504 ft., breadth 54 ft., depth 30 ft.; tonnage, 6,359 gross, 5,063 register. She is equipped with triple expansion engines with cylinders 22½, 36 and 60 ins. diam., by 42 in. stroke, 1,600 i.h.p., 80 r.p.m., supplied with steam by 2 Scotch boilers fitted with induced draught, 13¾ ft. diam., by 11½ ft. long, at a working pressure of 180 lbs.

The Great Lakes and Atlantic Canal and Power Co., Ltd., has been incorporated under the Dominion Companies Act, with \$250,000 capital and office at Montreal, to make surveys, etc., subject to the permission of owners of land, to take soundings, and obtain general data for the location and construction and improvement of canals, lakes, rivers, water courses, etc.; to own and operate steam and other vessels, dry docks, shipbuilding plants, etc., and for other purposes. The incorporators are: E. A. D. Morgan, G. A. Morrison, H. S. M. Caron, C. A. Hetu and L. J. Lefebvre, Montreal.

The New York Court of Appeals has held the repeal of the act granting certain water rights on the St. Lawrence River, to the Long Sault Development Co., to be effective. This company was organized in 1907, for the development of water powers at the Long Sault Rapids. The granting of the rights by the New York Legislature was strongly opposed by the Shipping Federation of Canada, the Dominion Marine Association, and other marine organizations, as tending to interfere with shipping generally. The act granting the rights was repealed in 1913, and the company appealed against the repeal.

Manitoba, Saskatchewan and Alberta.

The Peace River Transportation Co. has placed its first vessel in service between Athabasca Landing and Grouard, Alta. J. K. Cornwall, Royal Bank Bldg., Edmonton, is President.

The sternwheel steamboat City of Edmonton, owned by John Walters and Co., which is used for pleasure purposes upon the North Saskatchewan River, struck a snag recently but was beached at the shore, and the 500 passengers were safely transferred to the steamboat City of Strathcona,

The Dominion Parliament has voted \$14,600 for improvement of navigation in the Assiniboine River. The Minister of Public Works stated that the amount will be spent in removing obstructions such as rapids, rocks, etc., from the channel. Since the building of the St. Andrews locks, he announced, the water in the Red River has backed up considerably, and consequently there is now a fair amount of navigation on the Assiniboine.

British Columbia and Pacific Coast Marine.

The Governor in Council has approved of the Vancouver Harbor Commissioners' by-laws, 1 to 112.

F. O. White has been appointed Lloyd's agent at Victoria, under the jurisdiction of C. Gardiner Johnson, agent for British Columbia.

Application is being made to the Governor in council for approval of area, plans, site and description of works to be constructed in Victoria harbor upper basin.

The Pacific Coast Steamship Co.'s s.s. President inaugurated that company's service between Seattle, Wash., and Victoria, June 12, leaving later for San Francisco and other southern ports.

The Dominion Government will shortly call for tenders for the construction of a dry dock at Esquimalt, B.C. The dock is to be 1,100 ft. long, and will, in the main, be a duplicate of the one under construction at Lauzon, Que.

The C.P.R. s.s. Princess Margaret, intended for the British Columbia Coast service, was launched at Dumbarton, Scotland, June 24. The christening was performed by Mrs. R. Redmond, daughter of Sir Thomas Shaughnessy, President, C.P.R., who was presented with a platinum necklet by the builders.

The Grand Trunk Pacific Coast Steamship Co., commencing June 1, rearranged the schedule for its vessels. The Prince Rupert now continues to Stewart, making the Granby Bay call, and the Prince George, which hitherto performed the Stewart service, alternately with the Prince John, runs to Granby Bay only.

The contractors for the harbor development works at Ogden Point, Victoria harbor, Grant, Smith and Co., and MacDonnell, have chartered a floating dry dock from the Seattle Dry Dock and Construction Co., for use in building the piers, etc. The dock was towed from Seattle, Wash., to Victoria, by the C.P.R. steam tug William Joliffe.

The work of preparing the site for the Marine Department's depot on the Songhees Reserve, near Victoria will, it is expected, be completed by the end of July. Approximately 27,000 cubic yards of material were to be removed, and a wharf 650 ft. long will be built. Both sections of this work are being carried on simultaneously. Parks, Tupper and Kirkpatrick are the contractors.

Terminal Steam Navigation Co., Ltd., which was reported in our last issue to have purchased the s.s. Joan from the C.P.R., was incorporated in 1908 to take over the Terminal Steamship Co. Three vessels are operated, the Baramba, formerly R. P. Rithet, Britannia and Bowena. The company has a capital stock of \$200,000. The officers are, President, Capt. J. A. Gates; Secretary-Treasurer and Manager, S. L. Johnson, Vancouver.

A. D. Swan, M. Can. Soc. C. E., sailed from Montreal early in June for England, where it is reported that he is giving expert

evidence in a lawsuit there, on behalf of the Bristol Docks Committee. While in England, it is stated that he will, as consulting engineer to the Vancouver Harbor Commissioners, complete negotiations for the construction of the graving dock at Vancouver, plans for which have already been approved by the Dominion Government.

The B. C. Express Co., which operates vessels on the Fraser River, recently applied to the Supreme Court at Vancouver, for the removal of one bridge and the alteration of two others, which the G.T. Pacific Ry. had built across the upper Fraser River near Fort George. The application was dismissed with costs, on the ground that the construction of the bridges was sanctioned by the Government departments concerned, and that, from the evidence submitted, the company's business was not jeopardized. The judge pointed out that the application should have been made to the Board of Railway Commissioners, which has all jurisdiction over such matters, and if the business had suffered damage, an action could have been entered in the proper court.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

157. May 7. British Columbia, Strait of Georgia, sandheads of Fraser River, light-ship to be removed temporarily for repairs.

158. May 7. British Columbia, Strait of Georgia, Burrard Inlet, submarine bell buoy moored near Grey Point gas and bell buoy.

159. May 7. British Columbia, Strait of Georgia, Algerine Passage, Rebecca Rock, gas lighted beacon established.

160. May 8. Nova Scotia, south coast, Halifax harbor entrance, Sambro outer bank, light ship replaced by gas and whistling buoy.

161. May 8. New Brunswick, north coast, Chaleur Bay, Grande Anse, buoyage.

162. May 12. Quebec, River St. Lawrence, Lake St. Francis, off Knight Point, buoys established.

163. May 12. Quebec, River St. Lawrence, Lake St. Francis, Cherry Island, light discontinued.

164. May 12. Ontario, Lake Ontario, Port Dalhousie, Welland Canal entrance, emergency fog alarm.

165. May 12. Ontario, Georgian Bay, Wingfield basin, range lights established.

166. May 12. Ontario, Lake Huron, north channel, Killarney west, light improved.

167. May 12. Ontario, River St. Mary, Vidal shoals, gas buoy not to be established; spar buoy to be established.

168. May 13. British Columbia, Vancouver Island, east coast, Sidney, light established.

169. May 13. British Columbia, Strait of Georgia, approach to Nanaimo, Snake Island reef, bell buoy adrift.

170. May 15. Nova Scotia, south coast, Port Felix harbor, Hog Island, hand fog horn at light station.

171. May 15. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Lake St. Peter, curve no. 2, gas buoy established, spar buoy discontinued.

172. May 19. Prince Edward Island, east coast, extension to Souris East breakwater, temporary light liable not to be exhibited during gales, caution.

173. May 19. Quebec, River St. Lawrence, Batiscan anchorage, buoys changed in position.

174. May 22. Ontario, River St. Lawrence, Glengarry Point, gas buoy established.

175. May 22. Ontario, Lake Ontario, To-

ronto harbor approaches, buoyage.

176. May 22. Ontario, Georgian Bay, Meaford, new tower for breakwater light, new illuminating apparatus.

177. May 28. British Columbia, Burrard Inlet, Vancouver harbor, Burnaby Shoal, beacon light and fog bell established.

178. May 28. British Columbia, Cordero channel, southward of Erasmus Islands, Crawford anchorage, uncharted rock.

179. May 28. British Columbia, Queen Charlotte Sound, Pine Island, change in character of light.

180. June 1. Maritime Provinces and Quebec, Canadian list of lights and fog signals, new edition.

181. June 1. Nova Scotia, south coast, Halifax harbor entrance, Sambro outer bank, submarine bell buoy placed northward of gas and whistling buoy.

182. June 1. Prince Edward Island, north coast, Cascumpeque harbor, Alberton, change in position of range lights.

183. June 5. Quebec, River St. Lawrence, below Father Point, wreck of s.s. Empress of Ireland marked by gas buoy.

184. June 5. Quebec, River St. Lawrence, off Metis Point, submarine bell buoy established.

Another Accident to Lock Gates on the Welland Canal.

The numerous accidents in the Welland Canal of recent years, by which lock gates have been carried away, and in some cases, extensive damage done to the canal banks, to vessels and to the adjacent lands, seem to call for some different method of handling vessels while locking through. The adoption of a safety locking device to the gates is claimed to have proved successful in preventing gates from being forced by the rush of a volume of water from higher levels, but there still remains the question of vessels entering the locks with too great a way on them, in some cases caused through jockeying for position when several vessels are waiting to be locked through. There is also some evident carelessness in the handling of ropes, all of which should, on being established by strict enquiry into all the circumstances attending such accidents, tend to the forming of some strict regulations, properly enforced, for the handling of vessels through locks.

The accident happened June 10, about 4.15 p.m., when Canada Cement Transport's s.s. Pueblo, loaded with coal, downbound, through a misunderstanding of signals, it is said, struck and carried out the foot gates of lock 9. These were torn from their fastenings, and in addition, the two upper gates of the lock were carried out by the rush of water from the level above. The Pueblo was carried with the surge into the level below, a short one, striking and damaging the two head gates of lock 8, which were partly open, one of which had to be replaced by a spare one. The two head gates of lock 9 were badly broken and jammed together near the head of the lock. In addition, large stones, forming the course of the breast wall at the head of lock 9, were lifted bodily by the force of the water and deposited just above the upper recess, the removal of which necessitated the complete unwatering of the level. The lift at both locks is 12 ft., the level above lock 9 is about 2,300 ft. long, the flood water overflowing, however, did little damage to the surrounding fields, though the banks were considerably cut out at lock 8. The damage is estimated at about \$10,000. Spare gates were placed, the damaged one repaired, and navigation resumed about 11.30 a.m., June 13.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Hughton, Pinkham and Wiseton, Sask., and at Richdale, Alta.

Application was made to the Board of Railway Commissioners, June 26, for the extension of the express delivery and collection limits in Winnipeg.

The Board of Railway Commissioners has ordered the Dominion Ex. Co. to file a special tariff applicable to through shipments of milk or cream to Boston, Mass.

The Canadian Ex. Co. is being proceeded against in Moncton, N. B., for alleged violation of the Canada Temperance Act, in handling intoxicating liquor in prohibition areas.

The Board of Railway Commissioners has ordered the Canadian Northern Ex. Co. to file joint tariffs showing express rates on fruit and vegetables from its shipping point in Prince Edward County, Ont., to points beyond or via Smiths Falls, reached jointly by it, and Canadian, or Dominion Ex. Cos. that shall not exceed rates on said commodities published by Canadian and Dominion Ex. Cos. from Niagara district to same points.

The United States Express Co. ceased business June 30, in pursuance of the resolution of the directors at a special meeting called for that purpose, Mar. 13. The company was a joint stock association, the members of which each had full partnership liability for the company's obligations. It was organized Apr. 22, 1854, for 10 years, and for further periods at various dates, the last extension being for 20 years from May 1, 1904. As stated, the company ceased doing business on June 30, as a public carrier, but it will take several years before its affairs can be liquidated and its assets distributed. The President of the company is D. I. Roberts, who was appointed Jan. 1, 1913, having been, prior to that date, General Manager, Quebec, Montreal and Southern Ry., and Napierville Jct. Ry., Montreal.

Telegraph, Telephone and Cable Matters.

The Canadian Northern Telegraph Co. has opened offices at Pinkham and Wiseton, Sask., and at Richdale, Alta.

The Royal Society of Arts, it is announced, will award the Albert Medal for the current year to W. Marconi, for his services in the development and practical application of wireless telegraphy.

It is reported that the C. P. R., owing to increase in business, has leased the Okanagan Telephone Co.'s line between Vernon and Kelowna, B. C., pending the erection of a new line south from Vernon along the Okanagan Lake shore to Penticton.

The Great North Western Telegraph Co. has opened offices at Beaumaris, Cardinal Point, Charing Cross, Milford Bay, Petawawa Camp, Port Cockburn and Rosseau, Ont., Abenakis Springs Hotel, Chaudiere Basin, Little Metis Lighthouse and Riviere Ouelle Wharf, Que., and has changed the name of its office at Beaurivage, Que., to St. Florence.

The C.P.R. Telegraph Department has opened offices at Keith and Retlaw, Alta.; Cedar Creek and Malakwa, B.C.; Barkers, Colters, Minto, Newcastle and Ripples, N.B.; Port Hawkesbury, N.S.; Ingersoll Jct., Kenilworth, Levak, Nestorville, Petawawa military camp, Ont.; Cadillac, Java, Meyronne, Notokou, Pontix, Prelate, Regina Beach and Sceptre, Sask.; and has closed its offices at Keoma, Pearce, Seebe, Spring Coulee and Whitla, Alta.; Whonnock, B.C.; Antigonish, N.S.; Eldon, Folger,

Kama, Lochalsh, Middleton, Ramsay, and Trudeau, Ont.; Baring, Belbeck, Biggar, Blucher, Chandler, Crane Lake, Cross, Kedleston, Primate and Tregarva, Sask.

The C.P.R. Telegraph Department has issued the following notice to its operating staff,—“From an analysis of error statements it is shown that the majority of errors made are the result of indifference or thoughtless mechanical work. Palpable and preventible errors are underscored by the receiving operator on the assurance of the sending operator that it is according to copy; the underscore of the receiving operator becomes a confirmation of the error which goes through without further question to the addressee, often to his annoyance and always to the company's injury. The value of the simplest action depends upon the amount of thought put into it, and the large volume of business handled by the telegraph companies, and the small percentage of errors is a great compliment to the intelligence of the telegrapher and the thoughtful care most men put into their work, but as a chain is no stronger than its weakest link, the poor work of the few throws discredit on the good work of the many, and therefore it behooves all who take an interest in themselves and the company to prevent whenever and wherever possible the perpetration of errors. It is therefore ordered that operators will in future refer errors or doubtful words that cannot be corrected between themselves, to the chief operator, or traffic chief, who, if the correction cannot be made without undue delay, will forward the message subject to correction and service the office of origin for confirmation of the word in question. Operators who allow errors or doubtful words to pass, that might have been corrected, will have such cases charged against their record, and where such lapses are repeated, the local management shall apply the proper remedy to protect the good name of the company as well as that of its employes.

Association of Railway Telegraph Superintendents.

At the annual convention at New Orleans, La., recently R. G. Gage, Signal and Electrical Engineer, Canadian Government Railways, Moncton, N.B., J. McMillan, General Superintendent of Telegraphs, Western Lines, C. P. R., Winnipeg, and W. J. Kelly, Superintendent of Telegraphs and Telephones, Timiskaming and Northern Ontario Ry., North Bay, Ont., were among the new members elected, while in addition, the following were present from Canada, W. J. Camp, Assistant Manager of Telegraphs, C. P.R., Montreal, D. Coons, Superintendent of Telegraphs, Saskatchewan Division, C.P.R., Moose Jaw, and T. Rodger, Inspector of Telegraphs and Telephones, G.T.R. Papers were read and discussed on the following subjects,—unit cost of railway pole line construction and repairs, organization of gangs including plans for boarding the men, the fitting of applicants for telegraph and telephone service on railroads, organization of forces for restoring wire service interrupted by storms, wireless telegraphy in railroad service, physical and phantom transpositions, the printing telegraph, and the maintenance of telephone and telegraph equipment.

In the discussions on the various papers, W. J. Camp and J. McMillan took part, favoring the use of boarding cars against boarding houses for the use of gangs, the men themselves preferring them, and also on account of the difficulties in finding boarding houses in the immediate vicinity of the job in hand.

On the matter of utilizing telegraph line-men on telephone line maintenance, the Canadian representatives gave their experiences, and described the training given to the telegraph men to enable them to take care of the telephone equipment also.

In a discussion on a paper relating to the organization of forces for restoring wire service interrupted by storms, W. J. Camp stated that he found that the best results were achieved by using single or twin wires, and as to the strengthening of the poles, he pointed out that that would necessitate the strengthening of the crossarm, all of which would make construction much more expensive. He explained the methods used on the C.P.R. for supplying operators, and commented favorably on the refusal of the Board of Railway Commissioners to raise the age of employment from 18 to 21. In discussing the use of the printer telegraph on railroads, he said that on the C.P.R. various systems of printing telegraph had been tried with satisfactory results, and described the two printer circuits now being operated between Montreal and Toronto, and those between Montreal and Quebec and Montreal and Ottawa.

The 1915 convention will be held at Rochester, N.Y., from May 22 to 25, inclusive. Following are the officers for the current year,—President, W. C. Walstrum, Superintendent Telegraphs, Norfolk and Western Ry., Roanoke, Va.; First Vice President, E. C. Keenan, Superintendent Telegraphs, New York Central Lines, Chicago, Ill.; Second Vice President, L. S. Wells, Superintendent Telegraphs, Long Island Rd., New York; Secretary-Treasurer, P. W. Drew (since 1882), Superintendent Telegraphs, Minneapolis, St. Paul and Sault Ste. Marie Ry., Chicago, Ill.; Chairman Eastern Division, H. Potter, Superintendent of Telegraphs, Southern Ry., Washington, D.C.; Chairman Western Division, M. A. Clapp, Superintendent Telegraph, Northern Pacific Ry., St. Paul, Minn.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

THE GREAT LAKES RED BOOK. 143 pages, 4¼ by 3 ins., paper. Penton Publishing Co., Cleveland, Ohio. \$1.

This handy pocket size booklet contains the names of over 1,000 vessels operating on the Great Lakes, with the names of owners, captain and chief engineer in each case, for the current season. The names of the vessels are listed alphabetically and each bears a fleet number, under which the whole of the owning company's vessels, with the foregoing information, appears.

MARINE DIRECTORY OF THE GREAT LAKES. 484 pages, 6 by 9 ins., cloth. Mitchell and Co., Cleveland, Ohio. \$5 net.

This book is compiled with the idea of giving to all interested in shipping, complete information covering vessels, ore and coal docks, grain elevators, etc., on the Great Lakes. The information concerning the various vessels seems to be fairly complete, and it is arranged in convenient manner for quick reference. In addition to the general information concerning vessels, there are a number of historical facts concerning the Great Lakes, from their discovery to the present time, and descriptions of the various connecting waterways and canals, both Canadian and U. S., with charts of the various harbors. The book is well illustrated with a number of the best types of passenger and freight vessels on the lakes.

THE ENGINEERING MANUAL, 6 by 9 ins., 1½ ins. thick in loose leaf cloth binder. American Electric Railway Engineering Association, New York, N.Y. Price \$3. Binder \$1. Members of Association receive it free without binder.

This is a compilation of the standards and recommendations adopted by this Association and covers practically the entire field of electric railway engineering. It is in loose leaf form, and consists of 82 sections, fully illustrated with diagrams and working drawings. The loose leaf form has been adopted in order that the standards and recommendations may keep pace with such additions and alterations as are made at the Association's yearly conventions. Separate sections may be obtained.

SUPLEE'S MECHANICAL ENGINEERS' Reference Book.—By H. S. Suplee, B.Sc.; M.E. 964 pages; 4½ by 6½ ins.; illustrated. Published by J. B. Lippincott Co., Philadelphia, Pa.

The fourth edition of this handbook, originally published in 1903, has had the few errors appearing in the previous edition corrected, and a 40 page appendix added. Practically every branch of mechanical engineering has been collected in this book, and indexed in a very convenient manner, making it particularly handy for ready reference. The chief feature of value lies in the manner in which the data, secured from numerous sources, has been collaborated, and the essential information boiled down into small compass, so that it is not necessary to wade through a series of unrelated tests, as is common in many books of its type, to secure the data desired. As far as has been found practicable the information appears in tabular form, and where this has not been feasible, simple formulae, the factors in which are in intelligible form, are used. Each separate subject is developed in a concise manner from the fundamental considerations, so that where the tables and data are not readily understood from an unfamiliarity with the subject in hand, the development of the data can be easily followed if even a fundamental knowledge of engineering is possessed by the user. The edge of the book is indexed under the following main sections: Mathematics, mechanics, material of engineering, strength of materials, machine design, air, water, fuel, steam, steam boilers, steam engines, internal combustion engines, electric power, cost of power, and miscellaneous. These several heads are subdivided in the table of contents so that any general group can be readily located and the details are further subdivided in a complete index at the back, wherein are over 4,000 headings. The index is one of the particular features in which most books of this type are weak, but in this instance, it appears to have been prepared with great care, so that data on a very wide range of topics can be quickly located. A great many authorities for the information contained, are referred to, giving a clue to where more exhaustive information may be obtained.

R. P. Lewis, Traffic Supervisor, City of Winnipeg, Street Railway Department, writes, "I would be much obliged if you would place me on your subscription list for Canadian Railway and Marine World, as I think I will find the same a great asset to help me to carry out my duties."

The North Pacific Coast Passenger Association held its regular monthly session at the Empress Hotel, Victoria, B.C., June 16, H. W. Brodie, General Passenger Agent, C.P.R., Vancouver, presiding.

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.

Dearborn Chemical Co. of Canada, Ltd., Toronto, has appointed Jno. F. Franey, Western Manager, at Winnipeg.

The Lauzon Engineering Co., Ltd., engineers and contractors, Levis, Que., have been awarded a contract by the Levis City Council for paving Laurier Ave. and Commercial St., with medal vitrified paving block.

Canadian Allis-Chalmers, Ltd., Toronto, is distributing a booklet, "Pile Hammers," issued by McKiernan-Terry Drill Co., describing and illustrating pile hammers for contractors' use in driving wood sheathing, steel sheet piling and concrete piles.

The Titanium Alloy Mfg. Co., Niagara Falls, N.Y., has issued "Rail Reports Bulletin 6, Open Hearth," giving results of tests made on six pieces of rails, three of standard and three of Titanium treated open hearth rails rolled in Sept., 1913, for an eastern U. S. railway.

Brown Hoisting Machinery Co., Cleveland Ohio.—J. P. Case, who has been appointed Canadian representative, succeeding F. A. Peck, resigned, has been with the Brown Hoisting Machinery Co. for a good many years. He will spend all his time in Canada, and will be assisted by Hoyt E. Hayes, who has also had a practical experience in the material handling field.

United States Light & Heating Co.—L. R. Pomeroy, a railway and electrical engineer, has been appointed Manager of the New York sales office, 16-24 W. 61st St., of The U. S. Light & Heating Co., the general offices of which are now at Niagara Falls, N.Y. Mr. Pomeroy has under his direction the sales of the U-S-L axle electric car lighting equipment, U-S-L electric starter and lighter, and U-S-L storage batteries, in the territory of the New York branch office.

Canada Machinery Corporation, Ltd.—In connection with the new financing carried out by this company recently, whereby \$150,000 additional working capital was provided by the shareholders, certain changes in the management have taken place through the retirement of T. F. Kenny as General Manager, and in future T. H. Watson, the newly elected President, will assume the duties heretofore performed by the General Manager, and take an active part in directing the company's affairs.

The Detroit Lubricator Company will exhibit the new Detroit flange lubricator at the General Foremen's Convention at Chicago. The exhibit will consist of two wooden models of 45 degree sections of locomotive drivers with the lubricator installed in the same manner as in actual service. The whole apparatus will be rocked back and forth by an ingenious electrical contrivance to approximate working conditions on the road. The lubricator will feed oil on the flanges every time the lateral motion becomes pronounced, and easy observation of its construction and operation will be made possible by removing sections to display the internal mechanism. In addition to this a No. 22 bullseye locomotive lubricator, air cylinder lubricator and transfer filler will

be shown in operation. A complete line of locomotive lubricators, with from one to eight feeds, automatic steam chest plugs, air cylinder lubricators, transfer fillers, with sectional models and cross sections of parts will be displayed.

Transportation Conventions in 1914.

July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
 July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.
 Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.
 Aug. 20, 21.—American Association of Railroad Superintendents, New York.
 Sept. 1-4.—American Boiler Manufacturers' Association, New York.
 Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
 Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Nashville, Tenn.
 Sept. 22-24.—Railway Signal Association, Bluff Point, N.Y.
 Oct. —.—American Association of Dining Car Superintendents, Washington, D.C.
 Oct. 12-16.—American Electric Railway Association, Atlantic City, N. J.
 Oct. 19-23.—Association of Railway Electrical Engineers, Chicago, Ill.
 Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
 Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.
 Canadian Car Service Bureau, J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
 Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
 Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
 Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
 Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
 Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
 Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
 Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
 Dominion Marine Association, Counsel, F. King, Kingston, Ont.
 Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
 Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
 Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
 Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
 International Water Lines Passenger Association, M. R. Nelson, New York.
 Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
 Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
 Quebec Transportation Club, A. F. Dion, Quebec.
 Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.
 Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

The McEachern Tie and Timber Co., Ltd., has been incorporated under the Ontario Companies Act, with \$40,000 capital, and office at Thessalon, to carry on a general timber business, and to act as shipowners and carries by sea, etc. E. S., and H. S. Perryman, Chicago, Ill.; J. A., and M. T. McEachern, and W. McGuire, Thessalon, are the incorporators.

Consolidated Railway Act.—The Government bill providing for the consolidation and amendment of the Railway Act, which was referred to a dual committee of the Senate and the House of Commons, did not get beyond that stage last session of Parliament. It will be proceeded with next session.



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