

Electric Railway Journal

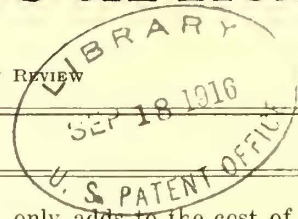
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No. 12



NEATNESS AND GOOD WORK GO TOGETHER

That was a fine idea of the mechanical department of the Portland Railway, Light & Power Company to brighten up the shop grounds with flower beds and sod, as described by the master mechanic elsewhere in this issue. The man, and his name is legion, who likes a bit of flower garden by his own home, can work better in attractive surroundings at the shop or office. Because railway shop work is dirty and sometimes necessarily odorous there is no reason why the shop must be surrounded by junk heaps or desert. On every hand one sees the results of efforts to beautify ugly spaces and structures, yet there are many left to be thus treated. All that is needed is for some one to take the initiative, and he will find ready hands and open purses all about him. "And it must follow as the night the day" that the work in the shop will be better done as a result of the appeal which beauty and order make to the esthetic sense in all of us. It could not be otherwise than it was in Portland, where "there has been a noticeable change in the appearance of the interior of the buildings, the men seeming to take a greater pride in keeping the shops in a neat and orderly condition."

WHO PAYS THE COST OF WASTED SALES EFFORT?

Aimless traveling on the part of manufacturers' representatives is about as productive of tangible results as a "nocturnal snipe hunting" expedition is in the Central West. It is expensive to the manufacturer and generally wastes the time of the railway officials who extend the usual business courtesies to these missionless emissaries. Either the expense of such traveling must be absorbed in the loading charge which is added to the cost of production, or it must reduce the profits of the manufacturer. On the other hand, manufacturers' representatives occasionally do not receive the usual business amenities, even when they respond to inquiries originating with railway officers. Calls which could be completed in a few minutes require the better part of a day. Whether the time is wasted by the manufacturer or the railway officer the cost in the end must be charged to railway operation. No manufacturer will continue to accept a profit reduced by a high sales cost, but he will add this expense to the cost of production. While it is equitable for the manufacturer to add the price of non-productive salesmanship to his cost of doing business, how much better it would be for the railway industry as a whole if the aimless traveling was obviated, and if the railway officers could be brought to appreciate that the time they cause a manufacturers'

representative to waste, only adds to the cost of operation. Conversely, there are well established ways of producing inquiries or arousing interest in a manufacturer's product without personal solicitation, and we will venture the assertion that the minimum amount of time is wasted by both the parties in question if the call is made in response to a direct inquiry.

THE COMING ATLANTIC CITY CONVENTION

The publication of the program of the American Electric Railway Association convention in this issue of the ELECTRIC RAILWAY JOURNAL is a reminder of the approach of the fall season and its accompanying convention. The coming convention means more than any preceding one to the electric railway industry, because the difficulty of conducting transportation at a profit is greater than ever before. It will be of interest also as the first at which the entire program of meetings, entertainment and exhibits will be under the direct management of the American Association. The two dozen committee reports which have been already distributed in advance form are tangible evidence of a substantial year's work and lead one to expect a profitable discussion. The exhibit space contracted for to date, more than 54,000 sq. ft., and the number of exhibitors who will use this space, more than 125, are very satisfactory under the present conditions of business in this field. As was suggested in these columns last year the convention program may be expected to reflect the deepest thought of the industry. It is significant, therefore, that the American Association program provides primarily for the consideration of the relation of electric railways to military preparedness, two fundamental elements of valuation, and publicity. Generals Leonard A. Wood and Erasmus N. Weaver will present the first-named, a representative of the valuation committee the second, and Ivy L. Lee the third. Certainly no more timely topics of general concern could be selected. The accountants, also, are to have several papers which should appeal to many outside of their immediate circle. "The Statistician," by W. E. Jones, statistician the Connecticut Company; "The Federal Census of Electrical Industries," by William M. Steuart, statistician Bureau of the Census, and "Some National Issues in Local Street Railway Franchises," by Prof. Clyde L. King, University of Pennsylvania, are among these. Aside from the general papers mentioned, and a few on more technical subjects, the program is made up of committee reports, the consideration of which forms more and more the basis for substantial work at the conventions.

WANTED— In spite of the assertion that a **NEW NAME FOR ONE-MAN CARS** rose by any other name would smell as sweet, there is no doubt that the choice of a good name for any new device has a great deal to do with its future success. This is a time when advertising writers are studying what they call the psychological effect of the words which they employ, and they tell us that a great deal depends upon first impressions. The instance which we have in mind is the one-man car. This name conveys the chief thought back of the car very clearly to the railway man, but some railway managements have found the name a handicap in popularizing the car on their lines. To the public the characteristic of the car to feature is not its economical advantage but some other merit. For this reason, if the car bore a name which represented the benefit which the public would get from its introduction, it would probably be more popular. This benefit, of course, is the frequent service which a company can give with these cars on lines with light traffic as compared with those which require two men to operate them. Possibly the title "frequent service car" would answer. At any rate, there is in the minds of a number of managements a demand for a popular substitute for the name "one-man car."

MAKING THE MOST OF SPECIAL TALENT

There is an increasing tendency to-day to recognize that efficient engineering involves not only the most efficient and economical use of inanimate materials, but also of the human element. In manufacturing work, for instance, experts in scientific management, in many cases, have been enabled to effect large savings by a careful study of men and materials. The bulk of these studies, however, has been concerned with the men in the ranks rather than the men higher up. The plan described elsewhere in this issue evolved by one of the large holding companies for the better utilization of special talent among the men occupying the more important positions in the company is, therefore, of special interest. The fact that the traveling experts which this plan involves are operating men who, in their regular positions, are meeting all of the problems of operation, trivial or important, annoying or otherwise, seems to us of great importance. The selection of such men as traveling specialists removes the objection so often advanced against holding company experts, that they are not in close enough touch with the plain, every-day work of the operating man. Moreover, such appointments should help the men appointed, because the opportunity to inspect the work of others should broaden their perspective and thus make their own routine work easier and more interesting.

While, of course, most electric railway companies do not have the array of talent to draw upon that a large holding company has, we wonder if many companies are making the most efficient use possible of the special talent that they do possess. To illustrate, the superintendent of one division of an electric railway system has made a special study of car routing, let us say.

Should his knowledge of this subject be made of use to the entire system or confined largely to the work of his own division? While granting that there is now a certain amount of interchange of ideas among the men employed by the average railway company, we feel that far greater co-operation along such lines is possible.

THE NEW YORK STRIKE

Developments in the New York situation during the past week have been that the Amalgamated Association on Sunday declared a strike on the Third Avenue Railway in defiance of its written agreement with that company that all disputes were to be referred to arbitration, the gradual resumption during the past seven days of service on the surface lines, the hearing on the causes of the strike by the Public Service Commission and the uninterrupted operation during the week of trains on the subway and elevated systems. In fact, the subway and elevated systems have been carrying about 400,000 passengers a day more than during the same period last year, so that if the purpose of the union in calling out the men on the surface lines was to punish the Interborough Rapid Transit Company for its refusal to give in to them, the primary effect of their action has been to add about \$20,000 a day to its income. The Public Service Commission, whose chairman "underwrote" the original pact of Aug. 7, presented on Sept. 12 a memorandum in the case of the Interborough system and New York Railways suggesting that arbitration be used to determine whether the Interborough individual working contracts—given by the union as the cause of the strike on the Interborough and the New York Railways—constituted a breach of the agreement of Aug. 7, and whether these contracts were obtained by fraud, misrepresentation, coercion or intimidation. The hearing of the commission on the Third Avenue strike was not begun until Sept. 14, and no conclusions had been reached at the time this paper went to press. The suggestion of the commission for arbitration on the Interborough contracts was rejected by the managers of that company on the ground that its employees had shown what they thought of the Amalgamated Association by remaining at work. It is difficult to see how any other answer could be returned.

It should be remembered in these discussions that the Interborough Rapid Transit Company, operating the subway and elevated systems in New York, and the New York Railways, operating about 150 miles of surface lines, are entirely separate corporations, with different stockholders and different operating organizations, but with the same general management. The agreement of the Amalgamated Association made on Aug. 7 was with the New York Railways only, and provided for arbitration in the case of disputes. No contract was made by the Interborough Rapid Transit Company with the Amalgamated Association, and the company decided instead to deal directly with its various employees. That this policy was justified has been shown by the loyalty of these men during the past

week. Surrounded as they have been by men on strike urging them to leave their trains, this force, consisting of more than 10,000 men, have kept steadily on almost without exception, and have carried not only those who usually patronize these lines but the overflow from the surface lines as well. By their actions they have proved that they are satisfied with the individual form of contracts and have justified the claim of the management that this feature of their employment is not subject to arbitration.

The position of the Amalgamated as regards the Interborough is therefore not very cheerful, but in the case of the surface lines it is even more unenviable. The excuse given for the strike on the New York Railways before a request for arbitration was made, as provided in the agreement, was that the union leaders had heard that the company was considering the possibility of making individual contracts with its men, although they acknowledged that no such contracts had been made, so that the company had not broken its part of the agreement. With the Third Avenue Railway even less of an excuse has yet been brought forward. The feelings of the leader of the strikers seem to have been ruffled because the president of the Third Avenue Railway referred to him in a letter to Mayor Mitchel as Fitzgerald instead of "Mr." Fitzgerald, and there were vague suspicions on the part of the men that the union was not in good repute at the offices of the company, and that the company would be apt to follow any policy which was adopted by the New York Railways. Altogether, the results of the week in New York justify the position taken by the companies that they do not propose to have any more dealings with this association.

THE BURDEN OF WAGES

A number of electric railway companies, including some very big ones, have recently found it necessary to increase the wage scale by varying amounts, none of them inconsiderable and some of them large enough to constitute a serious burden from the standpoint of dividend earning. Few people stop to consider the small residual fraction of the passenger's nickel which is left when necessary charges have been deducted. A change of even a few cents an hour in the wages of conductors and motormen will absorb the possible profit of a good many passengers, hence a country-wide problem confronts the electric railway manager in the upward tendency of the wage scale. Very naturally, as has often been mentioned in these columns, the company has appealed to the commissions for much needed help with varying results. The rising expenses of every kind have perhaps made the call for more wages a justifiable one. Transportation, however, on electric railway lines is one of the few things which has had a downward tendency in price during the last decade or two, owing to increased service and length of haul, and it seems not unreasonable that this tendency should be at least checked if not reversed. The practical trouble comes in adjusting the method by which this desirable end shall be accomplished.

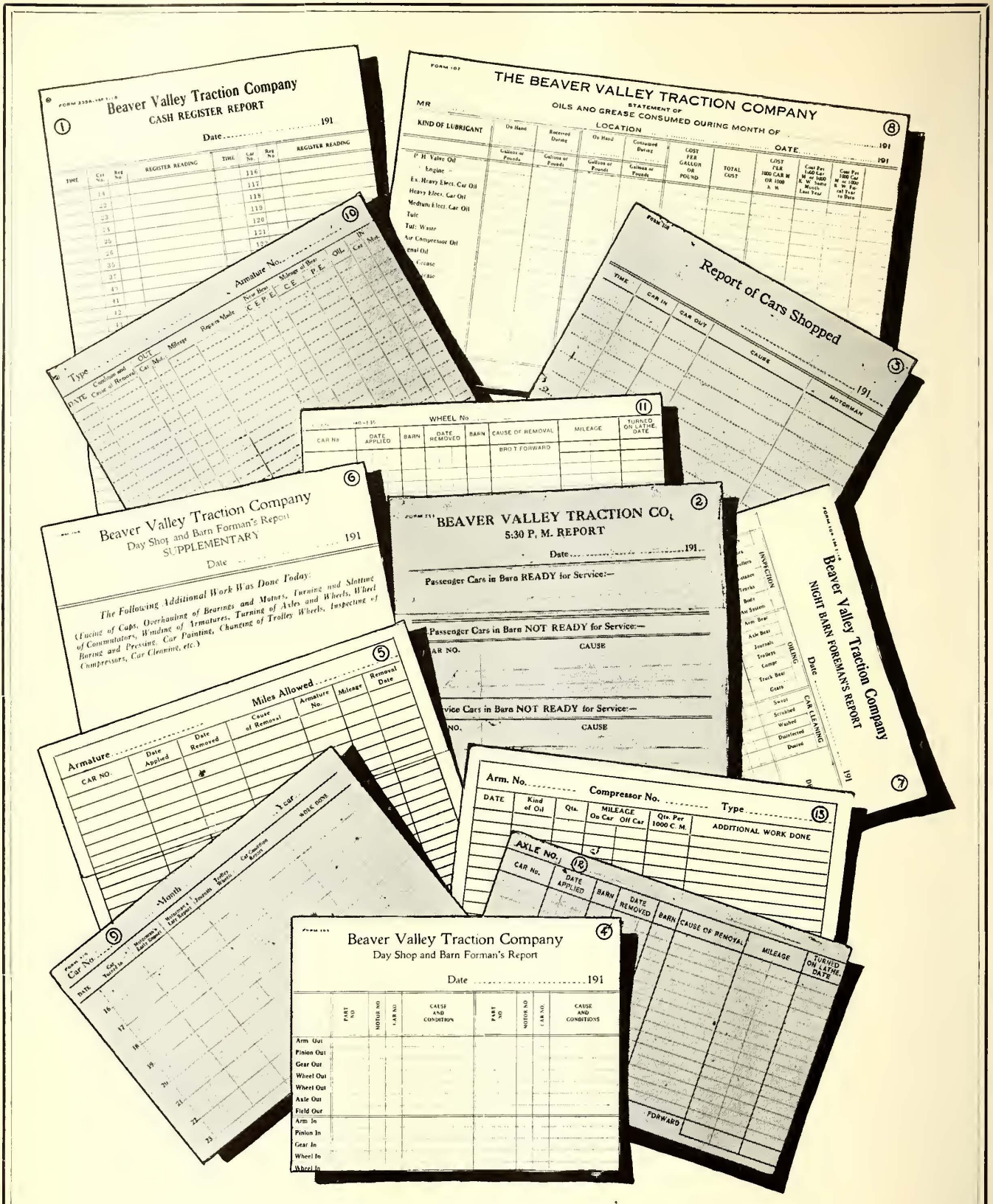
The purpose of this note is to call attention to the

desirability of a general concerted effort in some carefully selected direction on the belief that if the companies are united on a definite plan, or at least on a definite plan for each class of conditions, it will be easier to convince the public and the authorities of the desirability of higher fares. For city roads which present the most serious problem, three plans are open, namely, to curtail the transfer privileges, to adopt some sort of a zone system, and to add an extra cent to the nickel fare. The last expedient has not only the disadvantage of requiring two coins and the probability that the conductor will have to make change frequently, but also that it amounts to a straight increase of 20 per cent in earnings, except in so far as these are adversely affected on short hauls by such an increase, and a company has to come before its commission with a very clean record as to capitalization and great need in order to secure 20 per cent increase in net earnings. In some instances it has been accomplished, but it will probably be progressively more difficult to secure a 6-cent fare in city service.

Each company to a certain extent has its own problems to solve, but the analysis of the situation as it exists certainly suggests that cutting down transfers and careful modifications in the direction of zone systems furnish the best means of meeting the difficulty. There is no doubt whatever that many companies give transfers to an extent which is absolutely unnecessary from the standpoint of general public convenience and unfair so far as the transportation company is concerned.

An examination of the transfers on any large system shows that the number of preposterously long hauls given for a nickel is very considerable. To be sure some of the privileges extended are not utilized to any large extent, but others are employed to an amount which constitutes an abuse. Especially flagrant are the cases of the transfer of incoming passengers from one suburb to lines running in a similar direction to another. Rides of 15 miles or more for a nickel in these circumstances are not at all unusual, and the accumulation of statistics on the amount of this sort of unnecessary generosity if gathered together would make a formidable showing. Would it not be worth while to make a country-wide campaign for cutting down the maximum ride per unit fare to a more reasonable amount?

Probably even more effective in respect to earnings is a well organized zone system. Such a plan cannot well be carried out on the lines familiar abroad because the necessary corollary to a fully developed zone system would be a reduction of fare for the short hauls, which does not seem necessary. But the zone system with a minimum of 5 cents is in use in this country, as our readers know, with practically no collection inconveniences, and the extension of the system to one or two other cities would help greatly to popularize the idea as well as to demonstrate the extent to which it is generally applicable. This undoubtedly is one of the most important questions now before the industry, and one whose scientific study cannot be taken up too soon.



Blank Forms Which Are Used for Rolling Stock Maintenance Records
by the Beaver Valley Traction Company

- | | | |
|--|---|----------------------------|
| 1—Cash Register Report | 6—Supplemental Day Shop and Carhouse Foreman's Report | 9—Car History Card |
| 2—5:30 p. m. Report | 7—Night Carhouse Foreman's Report | 10—Armature History Card |
| 3—Cars Shopped Report | 8—Monthly Oil and Grease Report | 11—Wheel History Card |
| 4—Day Shop and Carhouse Foreman's Report | | 12—Axle History Card |
| 5—Armature Due Card | | 13—Compressor History Card |

Complete Records Help to Offset the Rising Cost of Labor and Material

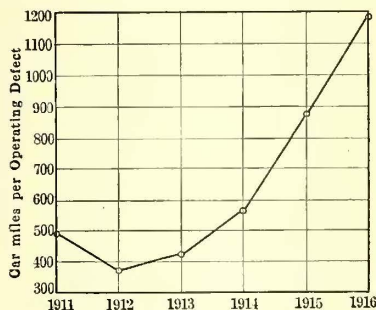
Rolling Stock Maintenance Cost Can Be Materially Reduced by a Record System, Which Accurately Checks Up the Work of the Employees as Well as the Performance of the Apparatus

By W. H. BOYCE

Superintendent Beaver Valley Traction Company, New Brighton, Pa.

IN the successful operation of any manufacturing concern detail reports are an absolute necessity. The same principle holds good in the proper maintenance of electric railway lines. Through the complete system of reports used in all departments of the Beaver Valley Traction Company, New Brighton, Pa., it is possible at any time to secure accurate and intelligible information as to the condition of the rolling stock and other equipment. Certain employees are held responsible for the making out of these reports and the rules governing them are strictly followed.

Our experience has proved that even in a property of this size, records of all kinds, and systems in all departments are profitable. One might think that on a road operating twenty-three to twenty-five regular cars



CURVE SHOWING CAR-MILES PER OPERATING DEFECT

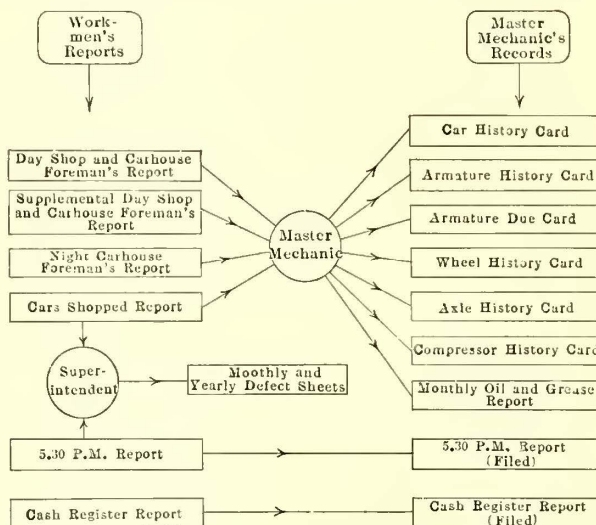
there would not be much demand for the number of records which are kept relative to the rolling stock, but a glance at the curve showing car-miles per operating defect for the past six years will readily disprove this. With the rising cost of labor and materials the management of a property should at any time be able to determine from the records the comparative cost per 1000 car-miles of even as small a thing as a trolley wheel.

The illustration on the opposite page shows the forms on which our car maintenance records are kept and the diagram indicates how the data from the workmen's reports are transferred in the master mechanic's office to the several history cards. Copies of two of these reports also go to the superintendent's office where the monthly and yearly defect sheets are compiled. An outline of the work covered by each report follows:

The cash register report, Fig. 1, shows the car number and cash register reading of each car in the carhouse when the day carhouse inspector comes on duty and the same data for each car turned in from operation during the day. The report is begun by the day carhouse inspector and finished by the night inspector and is filed in the master mechanic's office. A separate cash register report of the cars turned into the carhouse at

midnight is sent to the night cashier who checks it with the register closing statements on the conductor's reports.

The 5.30 p. m. report, Fig. 2, shows the number of cars in the carhouse at the time the report is made out, the number of cars not ready for service and the causes of their disability. One object of the report is to keep the day men on the job and reduce as far as possible the number of crippled cars which the day men leave for the night men to take care of. The report is made



METHOD OF KEEPING CAR MAINTENANCE RECORDS BEAVER VALLEY TRACTION COMPANY

in duplicate, one copy for the master mechanic and another for the superintendent.

The number of crippled cars turned in from service and the cause of the failure of each car are recorded on the report of cars shopped, Fig. 3. This is one of the most vital reports since it indicates the condition of the equipment by showing the failures and troubles of the cars in service. The superintendent receives a copy of this report and in his office the data are transferred to the monthly and yearly defect sheets. The master mechanic also receives a copy and transfers the data to the history cards.

The armatures, axles, etc., which are replaced during the day are recorded on the day shop and carhouse foreman's report, Fig. 4, which is filed in the master mechanic's office where the data are transferred to the history cards. Motor armatures are removed periodically on a mileage basis, 12,000 miles being allowed for a GE-54 armature, 15,000 miles for a GE-67, etc. For keeping a record to show when an armature should be removed the armature due cards, Fig. 5, are used, the information being taken from the day shop and carhouse

foreman's report. In determining when an armature should be removed we allow about 170 miles per day which takes into account the fact that the cars are left in the carhouse periodically for cleaning.

The supplementary day shop and carhouse foreman's report, Fig. 6, covers the miscellaneous shop work which is noted on the form. The data from these reports are transferred to the respective car history, armature history or other cards. The inspection, oiling and cleaning which is done at night is recorded on the night carhouse foreman's report, Fig. 7, and transferred from there to the respective history cards. The master mechanic keeps account of all lubricant used and records it on the monthly oil report, Fig. 8. The history cards to which reference has already been made are shown in Figs. 9 to 13 inclusive. The data from the various workmen's reports, described above, are transferred to these cards which form a permanent record in the master mechanic's office. These history cards thus show the operating record of the apparatus and the amount of repairs that have been necessary.

SHOP PRACTICE

In connection with the record blanks which have just been described, a brief outline of some of our shop practices may be of interest. The Westinghouse-328 motors are inspected every 600 miles or every third night, and all other motors are inspected every night. The air gaps are gaged with a hack-saw blade with the teeth ground off, or with a 1/32-in. sheet of fiber cut in a long strip. The motors are examined for the usual defects and the brushes and holders are inspected. The armature bearings are oiled every night and the axle bearings every other night. The latter are removed if they show a diametrical wear of over 1/8 in. The steel wheels are removed when the limit of wear gage, 5/8 in. in width, will slip down over the flange of the wheel. In cases where the tread of the wheel is less than 5/8 in. from the radial limit of wear line the flange is allowed to wear down as small as 1/2 in.

Four single-truck and two double-truck cars are cleaned on the interior each day and two single and one double-truck car are scrubbed thoroughly each day, the windows and outside of the car being cleaned when the cars are scrubbed. At night car cleaners sprinkle the floors of all cars with a disinfectant and then sweep them thoroughly.

Once every month each car is inspected from the trolley wheel to the rail. This has been the means of finding many small defects and thus preventing delays and more costly repairs. At this time the journal boxes are oiled and repacked, and we have found more frequent attention unnecessary. The air compressors are also inspected and filled with oil once a month. The amount of oil used is recorded on the compressor history card, a glance at which at once shows if the consumption is irregular.

In the summer season the aluminum lightning arresters on the cars are inspected after each storm by pulling off the trolley wheel and letting it make contact again. A sharp, snappy spark indicates that the arrester is in proper working condition. Every two weeks the night carhouse foreman inspects all aluminum cell arresters to see that they are properly filled and that they are not heating.

Work has been commenced on a new narrow-gauge railway to connect Motril and Ordiva, Spain. It is probable that when this railway is completed the tramway company at Granada will open a new tramway line between Granada and Ordiva, thus bringing the port of Motril within easy reach of Granada.

Signal Lights to Be Changed on the Pennsylvania System

White Lights for Proceed Signals to Be Replaced by Green Lights

WHITE lights are to be eliminated altogether as a signal indication on the entire Pennsylvania Railroad system, both east and west of Pittsburgh, Pa., as soon as the materials to make the necessary changes can be obtained. Green lights will replace white lights for "clear" or "proceed" signals while a bright distinctive yellow light visible at great distances will be used for a "caution" signal. A red light will continue to be a "stop" signal. The elimination of white from the signal color scheme has been rendered desirable by the increasing use of white lights of various kinds in buildings, driveways, roads and streets close or adjacent to the railroad's right-of-way.

This company, however, was unwilling to proceed with the change until a yellow glass could be obtained for the "caution" signal which would give a bright light at long distances. A light was desired which would not be liable to be mistaken for white, and thus be confused with other lights along the line of the railroad. Progress in the art of coloring glass, after years of experiments, has resulted in the production of such glass.

The adoption of the new signal system will mean the changing of hundreds of thousands of colored glasses and lanterns. This will require considerable time for completion, especially as slow deliveries are to be expected owing to industrial conditions resulting from the European war. Not only will alterations have to be made in all of the semaphore signals, but the following devices will also be affected: Marker lights on the rear of passenger and freight trains, switch lamps and targets, markers for track tanks, slow signs, resume speed signs, hand lamps at interlocking and block signal stations and lights displayed at crossing gates. Lights for the latter purposes will be red instead of green as at present.

This proposed signal system has been tried out on the extreme end of the New York division and has been found to work satisfactorily. It has also been adopted by branch lines of the Pennsylvania system so that desirable uniformity will be obtained. No change is to be made on those short portions of the system which are protected by "position light" signals in which the various indications are given by rows of electric lights showing against a black background in the various positions of the semaphore arms.

Louisville Railway's Interest in Factory Fund

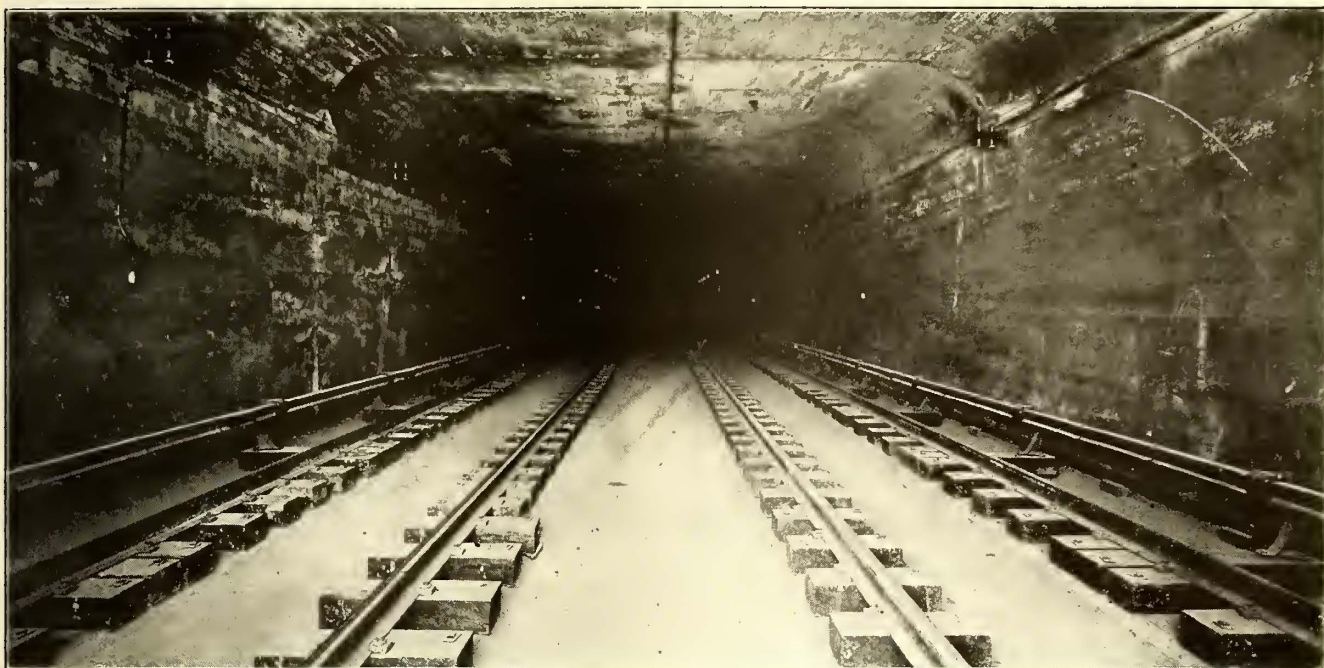
The Louisville (Ky.) Railway Company will ultimately be one of the principal individual beneficiaries of the "million dollar factory fund" which Louisville succeeded in raising by a nine-day campaign which closed recently. The railway company, with a subscription of \$25,000, was one of the largest subscribers, the only other similar subscription having been made by the Louisville Gas & Electric Company. Subscriptions announced at the close of the campaign were several thousand dollars over the million set out for, while there are still other additions to be made. Payments will be made in ten equal semi-annual installments, and the fund will constitute the capital of the Louisville Industrial Foundation, Inc., an adjunct of the Board of Trade. The organization of the corporation will begin at once, after which an industrial survey of the city will be made.

Unballasted Track Gives 50 Per Cent Lower Maintenance Cost

By WILLIAM S. TWINING

Director Department of City Transit,
City of Philadelphia

The author of this article was chief engineer of the Rapid Transit System in Philadelphia at the time that the subway in that city was constructed, and it was under his direction that the novel method of track construction there adopted was employed. It is interesting to learn that during nearly ten years' of service very few renewals have been found to be necessary and that no defects have developed which would suggest any desirable changes in the methods of construction.



PHILADELPHIA SUBWAY TRACK—VIEW SHOWING FOUR-TRACK TUNNEL

AT the time of the installation of the track in the Philadelphia (Pa.) subway in 1907 there was a great deal of interest manifested in the work owing to the fact that a new type of construction was installed. After nearly ten years of severe use this construction has given an excellent service record. Accordingly, the figures given below, showing the total yearly cost of this track construction as compared with the cost of ballasted track subjected to same service, are of value and interest.

The installation of track was described in the *STREET RAILWAY JOURNAL* in the issue of Feb. 16, 1907, and further details were given in the issue of May 4, 1907, but for the benefit of those unfamiliar with this type of roadbed a brief description follows:

The construction comprises two 12-in. 20½-lb. channels under each rail, the channels being spaced 15 in. back to back, with two 15-in. 33-lb. channels as permanent spacers. This steel work is assembled in the shop in 30-ft. lengths, then placed in position in the subway and accurately surfaced and aligned by attaching the rail thereto with temporary long ties spaced at intervals of about 15 ft. The channels are then

embedded in concrete to the height shown on the accompanying illustrations. The concrete is brought to a true plane about ⅛ in. above the channel flanges to afford a bed for the ties. The ties are 6 in. x 10 in. x 2 ft. yellow pine, surfaced to precise thickness and placed on the concrete at intervals of 2 ft. They are anchored to the channels by ¾-in. x 8-in. bolts passing through the ties (head up), the holes for this purpose having been previously provided in the flanges of the channels. After the ties are in place the rails are accurately aligned and fastened to the ties by means of screw spikes and cast-iron clips. The rails used are 90-lb. A. S. C. E. Bessemer steel in 60-ft. lengths. The carbon content is about 0.55 per cent.

The first section of track was placed in operation in February, 1907, and has been in continuous use since that date, or about nine and one-half years. The same rail and construction throughout as originally placed is still in service with the exception of the rail on curves, and probably the rail on tangents will have a life of about a year and a half more. During this period approximately 3,500,000 cars have used the track, or a tonnage approximating 140,000,000.

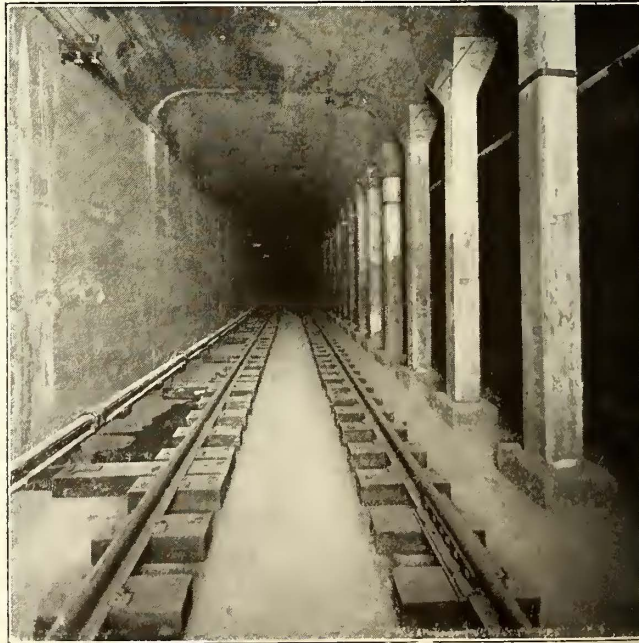
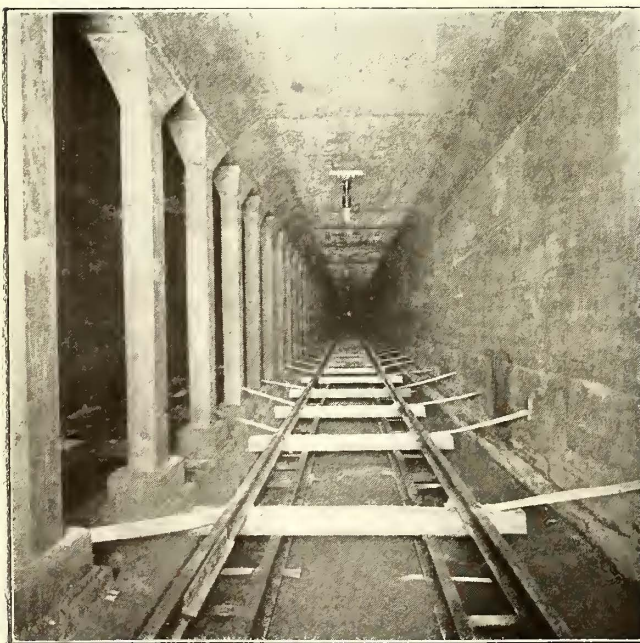
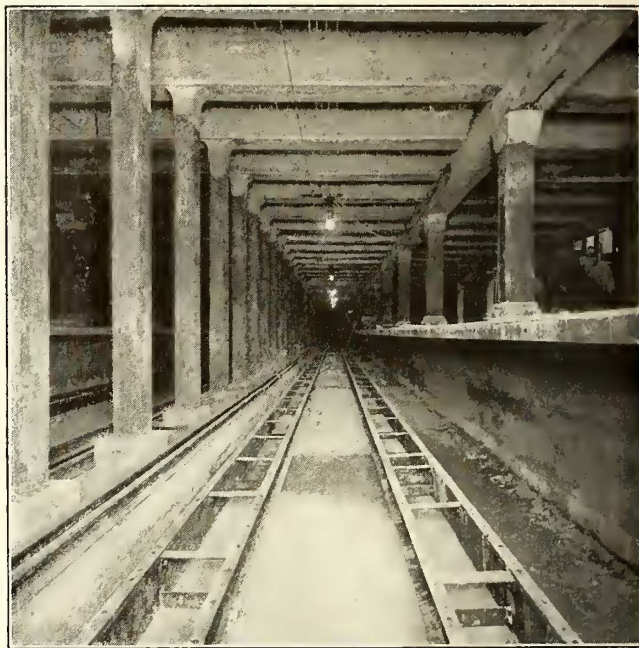
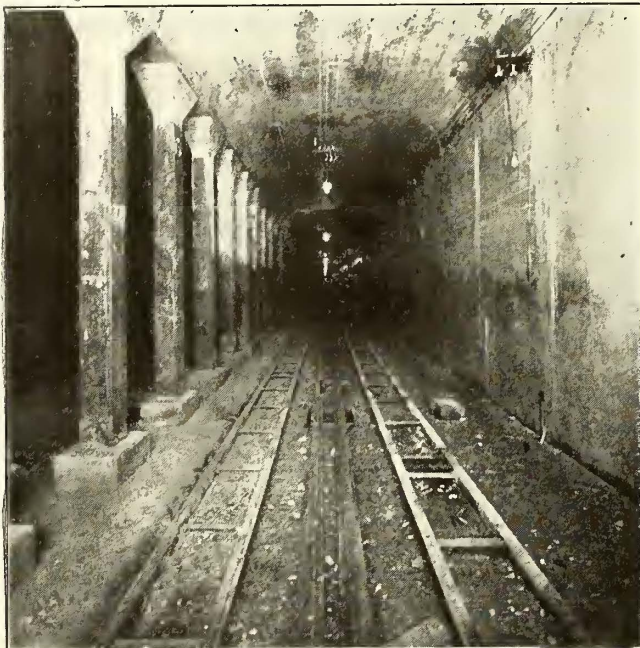
The tracks on the Market Street elevated line immediately to the west of the subway were laid at the same time with precisely the same type of rail and similar joint plates. The elevated construction consists of 6-in. x 8-in. x 8-ft. ties on stone ballast with a depth of 5 in. to 8 in. beneath the ties. The rail on the elevated structure was in such condition in 1912 as to demand renewal throughout the entire section between Twenty-ninth and Sixty-third Streets. This was done late in 1912 and early in 1913, after a life of six years, and during 1912 and 1913 the greater part of the ties were likewise renewed.

As there is no ballasted construction on any of the subway tracks in this city, the nearest approach to a comparison of maintenance cost between the subway type of construction and the ballasted type is a com-

parison of the subway with the section of the elevated above noted, both sections having been subjected to precisely the same amount of traffic. They are constructed with rail of the same weight and quality, and the same type of joint plates and method of fastening rails to ties.

An analysis of the expenditures running through several years, after eliminating such charges as would be common to any type of construction, indicates a maintenance cost for the subway track of about one-half that of the ballasted track, or approximately \$528 per mile per year for the subway track as against \$1,056 for the elevated ballasted track.

The initial cost of concrete construction is estimated at \$44,352 per mile, and the ballasted construction \$24,288 per mile. In the ballasted construction the cost



Philadelphia Subway Track—Views Showing the Four Steps Followed in Laying Rails

Each rail is mounted on a series of wooden blocks which are held in position by $\frac{3}{4}$ -in. bolts passing through the blocks and the upper flanges of two 15-in. channels. The channels are spaced 15 in. apart by separators, and the space between them is filled with concrete so that the wooden blocks rest directly on the concrete. No ballast of any kind is used, so that the subway is very easy to keep clean.

of a concrete sub-base under the ballast has been included. Basing an estimate on past experience we have placed the life of the rail in the concrete construction at ten years and in the ballasted construction at six years. As to the ties, we have no definite information as to how long untreated ties will last in the subway. The present ties are in first-class condition after nearly ten years of service, and for the sake of comparison we have placed the life at fifteen years, and the life of the ties in the ballasted construction at eight years. In both cases, of course, the timber is untreated. Basing estimates on these figures the results are, in round numbers, as follows:

Concrete Construction	
Interest on initial cost (\$44,352 at 5 per cent).....	\$2,218.00
Sinking fund for tie renewals (\$4,224 in fifteen years)...	192.00
Sinking fund for rail renewals (\$6,336 in ten years)....	496.00
Maintenance	528.00
Total yearly cost per mile.....	\$3,434.00
Ballasted Construction	
Interest on initial cost (\$24,288 at 5 per cent).....	\$1,214.00
Sinking fund for tie renewals (\$5,808 in eight years)...	600.00
Sinking fund for rail renewals (\$6,336 in six years)....	918.00
Maintenance	1,056.00
Total yearly cost per mile.....	\$3,788.00

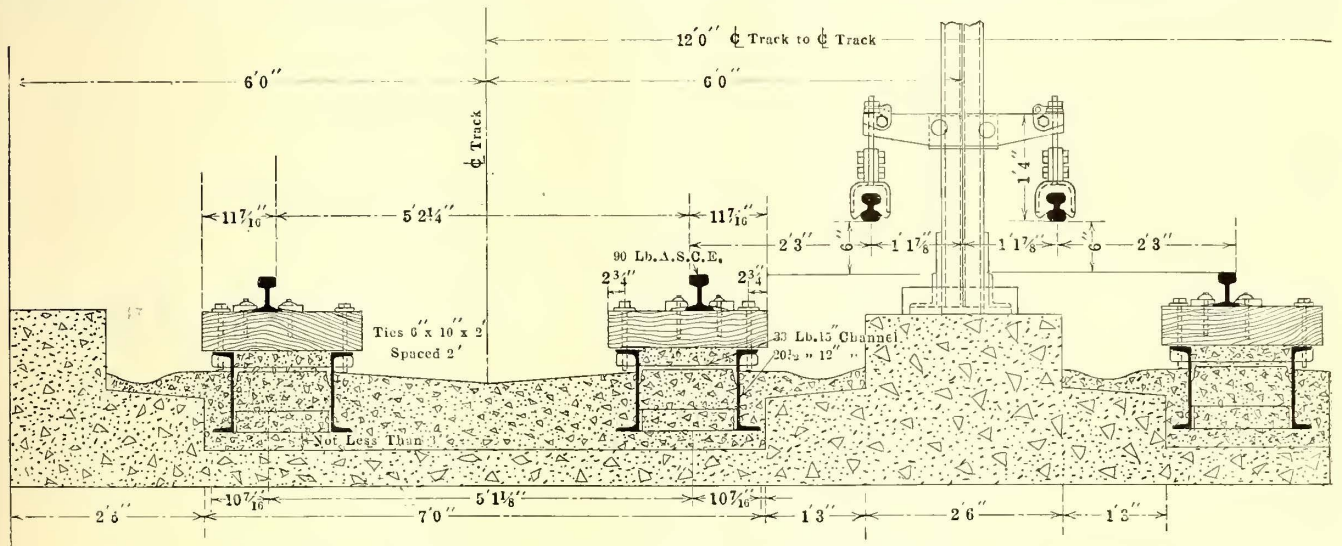
There is therefore a difference of \$354 per mile per year, or about 9 per cent, in favor of the concrete construction. In making this comparison, no reference has been made to the fact that the channels in the concrete construction provide steel of a cross-section of about 26 sq. in. for each track, which is used for return

with a permanent substructure, to avoid the continuous and expensive maintenance due to ordinary ballasted construction, especially as such work would be required in the limited confines of the subway; to avoid vitiation of the subway air by the accumulation of foreign materials which could not readily be removed, and to make all wearable portions easily accessible for inspection and replacement with a minimum amount of labor and the least possible interference with traffic. After nearly ten years of service there is no hesitancy in saying that our aims have been fully realized, and in addition to a reduced maintenance expense a substantially greater life has been secured in the wearable portions.

The actual maintenance work so far performed in the subway aside from the inspection and the replacement of the rail on curves, has been the renewal of a comparatively small number of the short ties and the changing of a few tie bolts and screw spikes which had broken, probably from being set up too tightly. It is readily seen from the drawing that such renewals can be made with two or three men, as each bolt or each tie can be removed and replaced independently of any other.

There is ample room between rails for the storage of any material required for repairs or renewals, and practically no interference with traffic is necessary except, perhaps, single tracking for very short intervals during the period of rail replacements. A few hours at a time during "owl" car service will suffice for this operation.

The cleanliness of the subway is, of course, a very important feature. The floor is practically a granolithic



TYPICAL CROSS-SECTION OF PHILADELPHIA SUBWAY SHOWING UNBALLASTED TRACK CONSTRUCTION

current purposes, in addition to the 18 sq. in. in the rails. The cost of return cable of an equivalent carrying capacity is thus saved.

It must be borne in mind also that the larger part of the repair work required on the elevated is performed in daylight, whereas the subway work is all performed under artificial light with the usual disadvantages incident to such work. Furthermore, a large proportion of the expenditure on the subway track was virtually inspection work, consisting largely of going over the bolts and screw spikes at frequent intervals to make sure that all were in good condition and to detect any weaknesses incident to a type of construction which had not been previously tried. With these facts in mind it may be safe to say that the difference between the maintenance cost of the concrete construction and the ballasted construction would be considerably more than as indicated above.

The object of the designers was to provide a track

surface, which can be cleaned either by flushing with water or sweeping with ordinary house brooms, both of which methods have been used effectively and to such an extent that absolutely no foreign matter of any description has been allowed to remain. The track space at station platforms is swept up each night during light traffic, and the other portions of the subway are cleaned at frequent intervals.

Finally it may be said that the ten years of experience with this construction have not indicated any defects that would suggest any desirable changes in the method of construction. Some time ago it was thought that should such construction be installed in a subway where the conditions of water to moisture would tend to cause rapid corrosion of the exposed face of the channel, it might be desirable to construct a special channel with a depressed flange so as to have the anchoring flange entirely surrounded by concrete. The need of this has not so far been disclosed by our experience.

Employees Repudiate Peace Pact

Third Avenue and Second Avenue men in New York City Disregard Settlement Plan of Aug. 7 and Strike Without Arbitration—Commission Recommends that Interborough Arbitrate Service Contract, but Company Refuses—Service on All Lines Increasing

THE strike situation confronting the Interborough Rapid Transit Company and the New York Railways, which seemed well in hand when this paper was published last week, was made more serious on Saturday night, Sept. 9, by the extension of the strike to two lines not at all concerned, the Third Avenue Railway and the Second Avenue Railroad, and in spite of supposedly sacred agreements entered into by the men on these lines to arbitrate all grievances. In spite of this repudiation of the settlement pact of Aug. 7, however, the companies involved proceeded to offer increasingly good service. The trunk subway and elevated lines of the Interborough Rapid Transit Company offered more than normal service, and the affected surface lines showed improvement daily. At present the fight seems won by the companies, although the union leaders are threatening to call a general sympathetic strike of trade unionists in order to strengthen the car men's failing cause.

STRIKE SPREADS TO SECOND AND THIRD AVENUE LINES

The strike of electric railway employees in New York City that was initiated on the subway and elevated lines of the Interborough Rapid Transit Company and the surface lines of the New York Railways on Wednesday evening, Sept. 6, was extended on Saturday evening, Sept. 9, to the surface lines of the Third Avenue Railway and the Second Avenue Railroad. During the day the Public Service Commission for the First District exerted every effort to hold the employees on these lines to the settlement plan of Aug. 7, but to no avail.

The new strikes went into effect immediately, and on Sunday morning, Sept. 10, the residents of Manhattan awoke to a realization that the most complete transportation tie-up in its recent history was in existence. Early in the morning the situation was made more serious by similar strikes called on the Union Railway, the Bronx subsidiary of the Third Avenue Railway, and on the Yonkers Railroad and the Westchester Electric Railroad, subsidiaries in Westchester County of the Third Avenue Railway. Thus, for the major part, the peace settlement of Aug. 7 had proved a failure, for all the surface lines in Manhattan and the Bronx were again in the throes of a strike. Only the employees of the New York & Queens County Railway in the Borough of Queens and the Richmond Light & Railroad Company in the Borough of Richmond, which also came under the Aug. 7 settlement, remained loyal to the peace agreement and, with the still unaffected employees of the Brooklyn Rapid Transit Company and the non-striking employees of the Interborough Rapid Transit Company, continued to offer their services to the people of New York City.

HOW THE PEACE SETTLEMENT WAS VIOLATED

The strikes on the large Third Avenue Railway system and on the small Second Avenue Railroad were not the result of specific demands made by the union under the settlement plan and refused by the companies, but rather were walk-outs in sympathy with the strikes on the Interborough Rapid Transit Company and the New York Railways. Indeed, at a strike hearing before the Public Service Commission on Thursday, Sept. 7, William B. Fitzgerald, union organizer, had testified that a

skeleton form of working agreement had been worked up for the Third Avenue Railway and was then the subject of conferences, and that as far as he knew peace and harmony prevailed and the method provided on Aug. 7 for adjusting differences in dispute was working satisfactorily.

According to a letter sent to Mayor Mitchel on Saturday, Sept. 9, by F. W. Whitridge, president Third Avenue Railway, the company had been considering in conference twenty-six demands of the union, and at the last conference, on Wednesday, Sept. 6, the company understood that it would receive in forty-eight hours a statement from the men as to what they were prepared to do. Up to Saturday nothing had been heard from them. The company, however, was ready to go ahead with arbitration with the least possible delay, and it had secured the consent of Lindley M. Garrison, former secretary of war, to act as its representative in the expected arbitration proceedings. Since Mayor Mitchel was one of the underwriters of the Aug. 7 agreement, therefore, Mr. Whitridge asked him on Sept. 9 to have the men nominate their arbitrator forthwith and also to fix some date within the next few days when if the men should not have named their representative, the Third Avenue Railway would in the Mayor's opinion be justified in considering that the men wished to abrogate their agreement.

The only answer to this letter on the part of the men was, as before stated, a strike late in the same evening. It was asserted by the union leaders that the sequence of events in regard to signing the Aug. 7 agreement and in regard to reinstating employees convicted of crime in the first New York strike a month ago showed that there was collusion between the traction lines of the city in an effort to destroy unionism, that the Third Avenue Railway in all cases was following the lead of the New York Railways and that it was only a question of time before the individual working agreements, which led to the trouble on the Interborough Rapid Transit Company and the New York Railways, would be circulated among Third Avenue Railway employees.

A FIGHT TO THE FINISH DECLARED

Before describing in detail the way in which the various transportation lines in New York were able to offer service to the public during the last week, it will probably be well to note the general moves in the whole strike situation up to the time of writing. After the union by its extension of strike orders to the Second Avenue and Third Avenue lines had showed that it did not intend to be bound by its agreement of Aug. 7, the traction officials of the city declared war in earnest on the Amalgamated Association. Collusion between the companies was denied, and it was pointed out that no individual working agreements had been circulated on the Third Avenue and Second Avenue lines. T. P. Shonts, president New York Railways, stated that it must now be apparent to everyone that it did no good to sign agreements with the Amalgamated Association and that there would be a fight to the finish. Mr. Shonts complained that some strikers were trying to intimidate loyal employees through the wives of the latter, and said that he was determined to stop this practice. Ac-

cordingly, as shown in the accompany reproduction, the New York Railways put up posters offering a reward of \$200 for evidence resulting in the arrest and conviction of any person who made to any female member of an employee's family any threat of personal violence toward such an employee or any member of his family for the purpose of intimidating him from the proper discharge of his duty. A similar offer was made by Mr. Shonts as president of the Interborough Rapid Transit Company.

President Whitridge after the Third Avenue strike order stated in a letter to Mayor Mitchel that the act of the union was obviously a breach of the agreement of Aug. 7, and that the striking employees had apparently spoken and behaved not as parties to a contract but as members of a secret society bound to obey the orders of a master. Accordingly, he accepted the men's repudiation of the Aug. 7 agreement, and would treat it thereafter as non-existent. As for the future, Mr. Whitridge said, no member of the Amalgamated Association would be employed on any of the lines over which he had jurisdiction, for the association had proved to be "a humbug." It was of no benefit to its members except the few who were officers, and it promoted disorder and disloyalty and was rapidly becoming a public nuisance. Mr. Whitridge emphatically stated in conclusion, in his letter to the Mayor, that he would have no dealings with the Amalgamated Association or with any one representing it until it was incorporated under New York laws and its accounts placed under the supervision of the Public Service Commission.

INTERBOROUGH NOT FIGHTING UNIONISM

In reply to a charge made on Monday, Sept. 11, by Mr. Fitzgerald to the effect that the companies had deliberately determined to crush unionism in New York, President Shonts and General Manager Hedley on the same day issued to the public an unqualified denial. The complete statement is shown in the illustration on the next page. The fact was, these officials said, the Interborough company had actually encouraged the formation of a union, to be entirely controlled by the men themselves and to include every employee on the payrolls not having disciplinary power over other employees. In short, the men of the company had an effective union of their own which was obviously satisfactory to them, and the real point underlying the existing difficulty was the determination of the Amalgamated Association to impose itself upon the company and to supplant the Brotherhood of Interborough Employees against the expressed will of the men themselves.

GENERAL SYMPATHETIC STRIKE AND OTHER AIDS SOUGHT BY UNION

As the week progressed, the outlook for the striking employees of the various lines gradually grew less rosy than they had expected, and various movements were instigated to strengthen their cause. The first of these was on Sunday night, Sept. 10, when delegates representing the American Federation of Labor, the New York State Federation of Labor, the Central Federated Union of New York and the Brooklyn Central Labor Union recommended a general sympathetic strike of the 750,000 trade unionists in the city in support of the Amalgamated Association. The leaders voted for this action on the ground that the right of organization was at stake. The action by the delegates was taken after Samuel Gompers, who had come to New York, had left the conference and had issued a statement saying that he favored all unions giving their moral and financial support to the car strikers, but not mentioning a sympathetic strike.

Although the threat of a general sympathetic strike in the city was at first received with forebodings by the

public, events throughout the week tended to cause the belief that such a strike was for the most part only "talk." First it was explained that before a general sympathetic strike could be called, definite action would have to be taken separately by the individual unions composing the central bodies, which would require a week's time. Then, on Monday, Sept. 11, the chairman of the conference committee of delegates announced that in the event of a sympathetic strike, only those unions would be involved whose members were directly concerned with electric railway operation, such as stationary engineers and firemen, longshoremen who handle fuel for the railways, and power-house employees. This would reduce the number of new strikers from 750,000 to not more than 70,000. At this writing no definite

New York Railways Company

New York, Sept. 9th, 1916

\$200

REWARD

A reward of \$200 will be paid for evidence resulting in the arrest and conviction of any person who makes to any wife, mother or other female member of the family of any employee, any threat of personal violence towards such employee or any member of his family for the purpose of intimidating him from the proper discharge of his duty.

NEW YORK RAILWAYS COMPANY
By **FRANK HEDLEY,**
Vice-President & General Manager

Approved:
THEODORE P. SHONTS,
President

NEW YORK STRIKES—TYPE OF REWARD NOTICE PUT OUT BY NEW YORK RAILWAYS AND INTERBOROUGH RAPID TRANSIT COMPANY

strike action by even any of these has been taken, although there are threats of developments next Monday.

Another effort to cripple the companies in their efforts to offer service in spite of the strikes was seen in the offering of four experience ordinances on Tuesday, Sept. 12, to the Board of Aldermen. One, a fair sample, provided, under a penalty of \$150 fine or six months' imprisonment or both, that no motorman or conductor should be allowed on any city lines without fifteen days' experience on some similar line in the city. The various resolutions were all referred to the general welfare committee, where it is expected they will remain. Still later reports, made on Wednesday, Sept. 13, were to the effect that recourse would be had to the State legislature for a compulsory arbitration law, and that the Board of Estimate and Apportionment would favorably consider a motor-bus franchise which has been before it for more than a year. It was denied, however, that the city authorities had any intention of using such means of reaching a strike settlement.

COMMISSION URGES USE OF ARBITRATION

In the meantime the Public Service Commission had been continuing its hearings of the prior week in the

matter of the Interborough and New York Railways strike situation, with Mayor Mitchel as one of the underwriters of the Aug. 7 settlement sitting with Chairman Straus, the other. As a result of the investigation into the causes and the parties at fault for the strike situation, the Mayor and the commission on Tuesday, Sept. 12, handed down a memorandum recommending that the Interborough and New York Railways strikes be called off immediately and that the negotiations between the companies and the men be taken up again at the point where they were dropped before the strikes began. Asserting that the rights of the public are superior to the rights of either the strikers or the company, the commission proposed that both sides submit to arbitration the questions as to whether the individual working agreements constituted a breach of the peace pact of Aug. 7 and whether fraud, misrepresentation, coercion or intimidation was used by the company in obtaining such contracts. Furthermore, in order that the parties might proceed with the conferences where left off and that friction might be avoided, the commission suggested that they agree upon some impartial person to preside or, if they could not do that, permit the Mayor and Chairman Straus to name such an impartial person, to have no authority in reaching a decision, but merely to preserve the parties from further misunderstandings and disagreements. Finally, the commission advised that all such conferences should be held in public.

In reaching a decision embodying the foregoing recommendations, the commission was actuated by reasons stated in its memorandum, in part as follows:

To the Public

Let no one be misled by the charge that the Interborough is trying to crush out unionism.

WE ARE NOT FIGHTING UNIONISM.

The fact is that the Company actually encouraged the formation of a union, to be entirely controlled by the men themselves and to include every employee on the payrolls not having disciplinary power over other employees.

The fundamental ideas of the Company in encouraging the formation of such an organization were:

1. That the men in their dealings with the Company should enjoy the benefits of collective action without expense;
2. That the public should be protected against sympathetic strikes arising out of disputes in which this Company and its employees were not concerned;
3. That more efficient service to the public would result if the relations between this Company and its men collectively were conducted within the Company's ranks and without the interference of third parties;
4. That the interests of this Company, its employees and the public they serve, would be fostered if all relations between this Company and its employees were conducted solely in the light of their common interests, rather than with reference to the interest of outside parties.

Some 9,700 men out of 11,800 eligible to vote embraced the opportunity to ballot for representatives to form a general committee of this union.

A working agreement was arrived at between the Company and this Union providing increased wages and improved working conditions for the next two years.

This was a "collective bargain" just as much as any union agreement is.

But the Company went one step further: it not only agreed to a contract with the men collectively, but it asked that the agreement also be submitted to each man individually.

That it was satisfactory to the men individually as well as collectively is shown by the fact that over 10,500 have signed and are now working under it.

An important feature of the Interborough Union is this provision for arbitration in the constitution adopted by the men, and unanimously approved by formal action of the Board of Directors of this Company:

"If for any reason the General Committee for the entire Brotherhood and the Officers of the Company are unable to settle any matter of mutual interest between them—it is then the plain duty of the Brotherhood and the Officers of the Company to submit the matter in dispute to a Board of Arbitration."

Thus the men of the Interborough have an effective union of their own which is obviously satisfactory to them.

The real point underlying the existing difficulty is the determination of the Amalgamated Union to impose itself upon the Company, and to supplant the union of the Interborough employees, against the expressed will of the men themselves.

This Company is only protecting its employees in their right to work and the public in its right to ride as against the efforts of the Amalgamated Association to prevent the doing of these two things.

INTERBOROUGH RAPID TRANSIT COMPANY.

FRANK HEDLEY,
Vice-President & General Manager.

Approved:
THEODORE P. SHONTS,
President

New York, September 11th 1916

NEW YORK STRIKES—INTERBOROUGH DENIAL AS TO FIGHT AGAINST UNIONISM

"On Aug. 10, when the commission filed its memorandum on the former strike, there was no agreement covering the subways and the elevated. On Aug. 30, it appears from the testimony before us, the Interborough Rapid Transit Company received a committee of its union men, attended by the same advisers and spokesmen who appeared before us in the matter of the other railways. After discussion, Mr. Hedley informed Mr. Fitzgerald and his associates that as the same men governed the policies of the Interborough system as governed the policies of the New York Railways, they might proceed upon the assumption that the principles and policies embodied in the New York Railways agreement of Aug. 7 would be regarded as controlling in the case of the Interborough lines. It was definitely agreed to by both that the principle of freedom to organize, the principle of freedom from intimidation or coercion, and the principle of arbitration should govern. Although this agreement was not reduced to writing and signed by the parties, it was approved by President T. P. Shonts and was relied upon by both sides in their subsequent negotiations.

"Prior to and during the hearings before us, the officers of the Interborough Rapid Transit Company sought to persuade their men not to join the Amalgamated Association. After the agreement of Aug. 7 they advised their men to form an organization of their own, as suggested by the president and vice-president of the company. The company stated that these suggestions were favorably acted upon, that nearly 10,000 out of about 11,000 voted to carry out this policy and that they selected committees to speak for them and elected offi-

INTERBOROUGH RAPID TRANSIT COMPANY

165 Broadway

New York, September 12, 1916.

TO ALL EMPLOYEES:

We thank our loyal men for their faithful and efficient services under trying conditions.

The Subway and Elevated lines have, by your good work, carried their usual number of regular passengers and in addition many who ordinarily use the street cars.

We urge you to continue your efforts to serve the public.

We have taken precautions for your safety.

If you are insulted or threatened, point out the wrongdoers to the police and report the facts promptly so that the evidence may be presented to the courts.

A large number of such offenders are now in the penitentiary.

You have a right to go about your business in peace and we believe that the Judges and police will put a stop to law-breaking in this city.

Keep up the good work and in a short time peace will be restored.

We are proud of you.

FRANK HEDLEY,
Vice-President and General Manager.

Approved:
THEODORE P. SHONTS,
President.

NEW YORK STRIKES—NOTICE OF APPRECIATION TO INTERBOROUGH EMPLOYEES

cers. The company contends that, as a result of the conference between the committees thus selected and their officers, working standards of wages and other matters were agreed upon; that this arrangement was submitted individually to the men, and that approximately 10,000 of them signed separately an identical memorandum or agreement embodying these terms. The company officials claim that this was done freely and fairly without violation of any of the principles of the agreement of Aug. 7 and that the men were permitted to and did exercise their constitutional rights. On the other hand, it is claimed by the officials of the Amalgamated Association that such a form of contract was in violation of the agreements of Aug. 7 and 30, and that these contracts thus signed by the men were secured through fraud, misrepresentation, coercion and intimidation.

"It appears that on Aug. 30 the officials of the Amalgamated Association first heard of the distribution of these contracts when the working standards were submitted to them as a basis for discussion. As soon as they had their counsel's opinion of the effect of this agreement upon membership in the union, they suggested that in addition to the four clauses there should be added the following:

"Nothing in this agreement is to be held to preclude any employee from joining any organization or any union, and will not preclude him from participating in any movement towards the betterment of his working conditions or the increase of his wages, and in the event that he sees fit to join such an organization with such objects in mind, it will not be considered a breach of this agreement."

"It appears from the minutes of the conference and the direct testimony before us that if such a course had been accepted, difficulty might not have arisen at this time. It is regrettable that at this point the parties apparently became distrustful of each other. From the testimony it appears that the men believed that an attempt was being made to deprive them of the rights which had been guaranteed to them by the agreement of Aug. 7. On the other hand, the company officials apparently believed that the officials of the union were seeking to prevent the men from exercising their right to prefer the Brotherhood of Interborough Employees to the Amalgamated Association.

"The union leaders concede that at this time no effort was made to utilize the processes or machinery of arbitration provided in the agreement of Aug. 30. On Sept. 1 a communication was sent to the chairman of the Public Service Commission by counsel for the men enclosing a copy of a letter to the Mayor, but attention is directed to the fact that in this communication it is expressly stated that no complaint is made 'at this time' to the commission, to the Mayor or to the chairman of the commission. Nor does there appear in the resolutions adopted by the men anything indicative on their part of readiness to follow the methods provided for in the agreement for arbitration. Yet the claim is made before us by the spokesmen for the union that on Aug. 30 there was an obligation on the part of the Interborough to arbitrate all differences that might arise, even though they involved questions of personal honor.

"It is our opinion, after listening to both sides and carefully reviewing the testimony, that whatever may be the condition of the mind of the officers of the union or the officers of the company, there is a clear duty to the public which the underwriters of the agreement of Aug. 7 and this commission have the right to assert. This controversy does not involve the issue of trade unionism in this city. To-day, as on Aug. 7, the clear, legal and moral principles governing the situation remain the same. Each side believes that it is standing for its rights, but the rights of both sides are subordinated to the rights of the public, and it remains as true to-day as Aug. 7 that the public's right to have

controversy upon its railroads settled peaceably and without resort to a war of any kind is a right superior to the rights of either the men or the company.

"We believe that the agreement has not been destroyed by the acts of the parties. Though it has been violated, the moral obligation to maintain it still continues. It was deliberately made, and guaranteed by the Mayor and the chairman of this commission. The public was also a party to this agreement. Whatever the other two parties may do, they cannot deprive the public—the third party—of its rights under the agreement. It was the clear intention of all parties concerned, including the Mayor and the chairman of the commission, that neither side should resort to the strike or lockout until there had been recourse to arbitration. There should be in existence effective legislation to meet such situations as these, but in the absence of such legislation there is no reason why the moral pressure of the whole community should not be exerted to compel both parties to observe the agreement which they state was in its essence fair and reasonable and which they regarded as 'sacred.'"

Commissioners Hayward and Hodge dissented from the first part of the finding, providing that the question whether the distribution of the individual contracts constituted a violation of the settlement plan should be arbitrated. These two commissioners were of the opinion, it was reported, that the individual contracts were sent out by the Interborough Rapid Transit Company before Mr. Hedley on Aug. 30 orally pledged the company to follow any of the provisions of the New York Railways settlement of Aug. 7, and therefore the Interborough line could not be asked to arbitrate something done during the interval while they were not under any obligations whatever.

INTERBOROUGH AND NEW YORK RAILWAYS REFUSE TO ARBITRATE

After learning of the proposals made by the Mayor and the commission, the New York Railways and the Interborough Rapid Transit Company on the same evening each issued a notice to employees refusing to consider any of the propositions put forward. In regard to the charges of fraud, etc., in the obtaining of the individual working agreements, it was averred that the best evidence of their falsity was the fact that so many employees were carrying out the contracts and rendering service in spite of the strike calls. As for arbitration and the continuation of conferences with the union, it was emphasized that no further dealings would be had with representatives or members of the Amalgamated Association.

On Wednesday morning, Sept. 13, the commission resumed its hearings in order that it might receive the formal replies of the companies and the union to its plan of settlement. In reiterating the stand taken on the previous evening, President Shonts through counsel submitted a statement in part as follows:

"The Interborough Rapid Transit Company cannot arbitrate its right to enter into agreements with 10,306 of its employees out of a total of 11,800, when the employees who have signed are content with those agreements and are endeavoring to carry them out in good faith. It cannot arbitrate its own good faith in becoming a party to those agreements, when they are definite as to pay and terms, signed by the employees upon the recommendation of their own duly appointed agents, and to-day are fully accepted by the great mass of our loyal employees.

"The New York Railways cannot arbitrate the causeless desertion of its service by its striking employees when their differences with the company were in process of orderly adjustment under the terms of the agreement

of Aug. 7 underwritten by the Mayor and the chairman of the commission.

"The officers, agents and members of the Amalgamated Association have constantly made either veiled or open threats of a strike while we were endeavoring by conference to adjust all matters of difference with our employees. It is apparent that they cannot be depended upon to keep their agreements for the peaceable and orderly adjustment of differences.

"Any further conferences with such men would get us nowhere, and in the meantime our discipline would be demoralized, to the great injury of the public and ourselves. Both companies must respectfully decline to hold any further conferences with the officers, agents or members of this association, or of any persons affiliated with them."

UNION WOULD ARBITRATE INDIVIDUAL WORKING CONTRACTS AND MANNER OF OBTAINING THEM

The answer of the union to the proposals of Mayor Mitchel and the commission, in general one of acceptance covering all the railways then affected by the strikes, was stated by Mr. Fitzgerald in language in part as follows:

"While we are concerned mainly with the recommendations made by the Mayor and the commission, there is one statement made by the commission in its opinion which we cannot permit to pass without comment, *i.e.*, that 'this controversy does not involve the issue of trade unionism in this city.' We most decidedly take exception to this statement and submit that it is unwarranted and unjustified by the evidence.

"Any position which I might take with reference to the recommendations of the Mayor and the commission would be dependent upon the companies agreeing that all employees, including those who have been discharged by the company, be restored to their former positions and ratings without prejudice as of Aug. 29, and that both the companies and the employees be placed in the position as to all matters as of Aug. 30, this to include recognition by the company of their right to organize, their right to meet collectively and in conference with the company, and the right of arbitration of all matters in dispute which cannot be mutually agreed upon in conference.

"We will arbitrate the question of the fairness or unfairness of the individual contract of employment, called by the company 'working agreement.' We will also arbitrate the question of the fairness or unfairness of the methods employed by the company in obtaining signatures to them, and we will be only too pleased to take the suggestion of this commission that the conference heretofore held between the companies and the committee of the employees and their spokesmen should be continued with an impartial person who should have no authority to decide, but merely to preserve the parties from misunderstandings and disagreements, and that such conferences in the future should be held in public. These suggestions as to an impartial person presiding over the parties and the public character of the conferences are most excellent ones."

At this point Mr. Fitzgerald read from the memorandum of the commission that had a paragraph been added to the Interborough's individual working agreement with the men allowing them full union rights, the present strike situation might not have arisen, and then proceeded as follows:

"In view of this finding, of course, we expect that the members of our organization shall, notwithstanding these so-called 'working agreements,' have the right not only to enjoy all the benefits of our organization, but to

participate in all of its deliberations in any way they see fit."

COMMISSION INVESTIGATES THIRD AVENUE CASE

In the memorandum of Sept. 12 the Mayor and the commission carefully refrained from making any reference to the Third Avenue and Second Avenue strikes, evidently because of the feeling that one general plan of settlement would be sufficient for all lines. With the rejection of its proposals, however, the commission proceeded to take up in detail the case of the Third Avenue Railway, and the first hearing was held on Thursday afternoon, Sept. 14.

At this hearing, before Mayor Mitchel and the commission, Mr. Fitzgerald repeated his charges of collusion between the Third Avenue Railway and the New York Railways, but Alfred A. Cook, attorney for the former company, stated that there had been no conference or communication, direct or indirect, between any representatives of these companies either in regard to signing the settlement pact of Aug. 7 or with reference to any unanimity of action in carrying out such an agreement. President Whitridge stated emphatically that he had had no conferences with New York Railways or Interborough Rapid Transit Company officials and had not talked or communicated with any of them regarding strike matters. Mr. Cook testified that he had not drafted any individual working agreement for Third Avenue men, and that this point to his knowledge had never been contemplated or discussed. Edward A. Maher, Sr., vice-president and general manager of the company, also declared that such an agreement had never been suggested or considered.

In regard to the company's position concerning arbitration, Mr. Cook said that when Mr. Whitridge returned from Europe on Aug. 28 he accepted without discussion the settlement agreement made in his absence, and ordered that it be carried out in letter and in spirit. At the first conference with the men Mr. Whitridge asked for an abatement of their demands in order that a mutual agreement might be made without arbitration. He at no time refused arbitration, but simply endeavored to avoid the expense and delay of arbitration by asking the employees to lessen their demands, especially on the point of wages. As the conference continued, some of the demands were agreed upon, and others were left for arbitration. At the last conference, on Sept. 6, Mr. Maher told the men that without doubt a number of points would have to be arbitrated, and that the company would like to get at the matter promptly and was prepared to go ahead at any time. The men said that they would suggest an arbitrator in about forty-eight hours. Thereupon the company selected Mr. Garrison, but the next move of the men was the strike on Sept. 9.

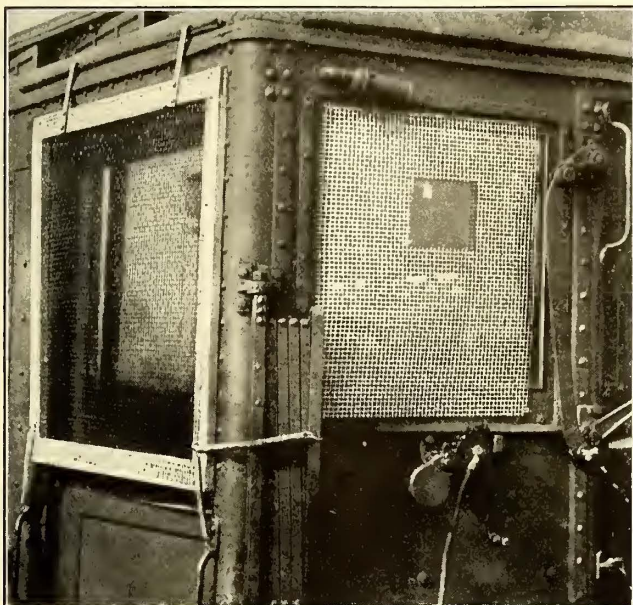
At the hearing the commission entered on its record the report of a conference on Sept. 9 at the Bar Association between Mayor Mitchel, Chairman Straus, union leaders and head of the Third Avenue locals. It was shown that at this meeting, which was before the strike order, the Mayor urged the men to keep the peace agreement of Aug. 7, for in his opinion to go on strike in the face of Mr. Whitridge's proposal to arbitrate would be a deplorable breach of the agreement. Mayor Mitchel stated that not even a declaration of intent or purpose on the part of the company would justify the men in breaching the contract, for if they had any grievances the only proper recourse was to arbitration under the contract itself. Chairman Straus took the same point of view, but the men refused to abide by it and struck.

HOW THE SERVICE WAS KEPT UP

The main fact clearly discernible from electric railway operation in New York City from Sunday, Sept. 10,

up to the time when this issue went to press was that the first strike, that on the subway and elevated lines of the Interborough Rapid Transit Company, had proved a flat failure and that the subsequent strikes on the various surface lines in Manhattan and the Bronx were gradually wearing themselves out.

On Sunday, the elevated and subway lines of the Interborough Rapid Transit Company were hit with an avalanche of passengers on account of the suspension of service on the Third Avenue and Second Avenue lines but more than normal service was offered, and the same standard was maintained during the week. On Wednesday, the elevated and subway service was 20 per cent more than normal in the rush hours. On Monday the total number of passengers on the elevated and subway



NEW YORK STRIKES—SAMPLE OF WIRE SCREENS USED TO PROTECT MOTORMEN

lines was 2,281,442, as compared with a total of 1,898,660 for the same day of last year. On Tuesday the total was 2,091,341, as compared with 1,653,653 last year; on Wednesday the total was 2,091,171, as compared with 1,635,540 last year, and on Thursday the total was 2,078,755 as compared to 1,629,166 last year. On Thursday the company reported that 10,306 out of its 11,800 employees had signed the individual working agreements. A notice issued during the week, thanking the employees for their loyal and efficient service under trying conditions, is reproduced on page 486.

Service on the New York Railways during the week, while not starting so well as expected, became gradually better. The proclamation of amnesty to striking employees if they would return before 1 p. m. on Saturday, Sept. 9, resulted in about 100 employees going back to work, and this number continually increased during the week. The company early determined not to employ strike-breakers on the surface lines, in order to avoid violence, which naturally handicapped it in offering service to the public. In spite of this fact, however, the maximum number of cars in operation gradually rose from 250 on Sunday to 327 on Thursday, the normal being about 1290. The individual contracts increased in this time from 958 to 1015. On Wednesday, the company dismissed one-third of the 3000 strike-breakers that had been secured by itself and the Interborough Rapid Transit Company, for it was found that enough experienced men could be hired to restore the service gradually to full operation with the aid of old

employees. On Wednesday, ninety-five experienced men were chosen from 600 applicants.

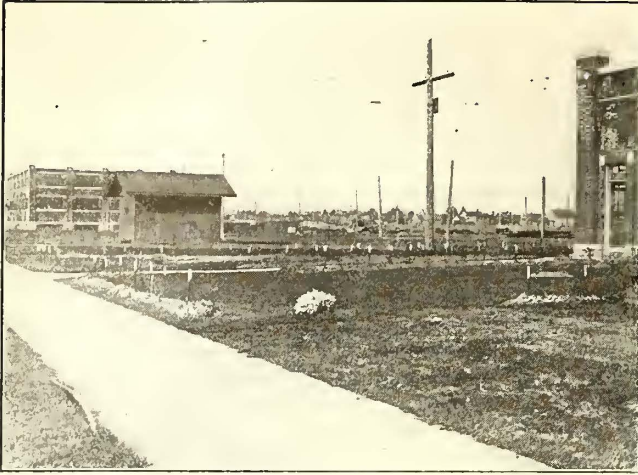
The various sections of the Third Avenue Railway system showed different degrees of success in operating cars during the week. The lines of the Yonkers Railroad and the Westchester Electric Railroad in Westchester County did not offer any service at all to the public on account of the restrictive experience ordinances in Yonkers, Mount Vernon and New Rochelle. The Union Railway, the subsidiary operating in the Bronx, started out with thirty-two cars on Sunday and gradually increased the number to 141 on Thursday, 252 being the week day normal. The Third Avenue Railway proper, operating in Manhattan, had forty cars in operation on Sunday and increased this number to 248 on Thursday, the weekday normal being 505. On Sunday the company offered double pay to employees who remained loyal and about sixty returned at that time. More came back later, but the strikebreakers to some extent were used on the red car lines.

No strikebreakers were used on the cars of the Second Avenue Railroad. Instead of the normal 105 cars on week days the company operated from twenty to twenty-six. It was stated that most of the Second Avenue men were not on strike but were intimidated from operating the cars.

During the week the service on the surface lines was suspended at night in order to avoid violence. Extra service in suburban districts was given by the New York Central Railroad and the New York, New Haven & Hartford Railroad, and all sorts of automobile conveyances were used in the city, especially for cross-town travel. On the whole there was not much disorder in connection with the strike, owing to the precautionary measures taken by the company and the police. Wire screens, such as shown in the accompanying illustration, were used on rapid transit and surface cars, and passengers were prohibited from riding on the elevated platforms in order to keep strikers away from brakes and emergency cords. There were many instances of bricks thrown at surface cars and elevated trains and occasional attacks on those who remained on duty, but there was no rioting.

Illinois Commission Report

The second annual report of the Illinois Public Utilities Commission, advance sheets of which are just off the press, indicates the divers activities of the State regulatory body. The report discloses that the commission has entered orders in 1644 formal cases, of which thirty-nine, or 2.4 per cent, have been appealed to courts possessing jurisdiction. Of these appealed cases thirteen were carried to the Supreme Court of Illinois, which reversed the commission in only two of its orders, and reversed the Railroad and Warehouse Commission, the predecessor of the present commission, in two other orders. Thus the commission itself has been finally reversed in only one-tenth of 1 per cent of its orders. The commission, since its inception in January, 1914, to the date of the second annual report, has disposed of 770 informal cases requiring more or less extended investigation, and has received fees (principally for authorization of securities) amounting to \$816,223 against disbursements for salaries and other expenditures amounting to \$309,883—a net balance turned into the State's treasury of more than \$500,000. A complete tabulated list of the stocks, bonds and other securities authorized by the commission shows that all stock is required by the commission to be sold at par, and, with two exceptions, all bonds were required to be sold at 85 or above.



PORTLAND RAILWAY COMPANY'S FLOWER GARDEN JUST GETTING STARTED



THE OFFICIAL PORTLAND ROSE—ONE OF MANY IN THE RAILWAY COMPANY'S GARDEN

Shop Grounds Beautified by Roses

Portland (Ore.) Railway Plants a Flower Garden in Which Its Men Take a Keen Interest

BY F. P. MAIZE

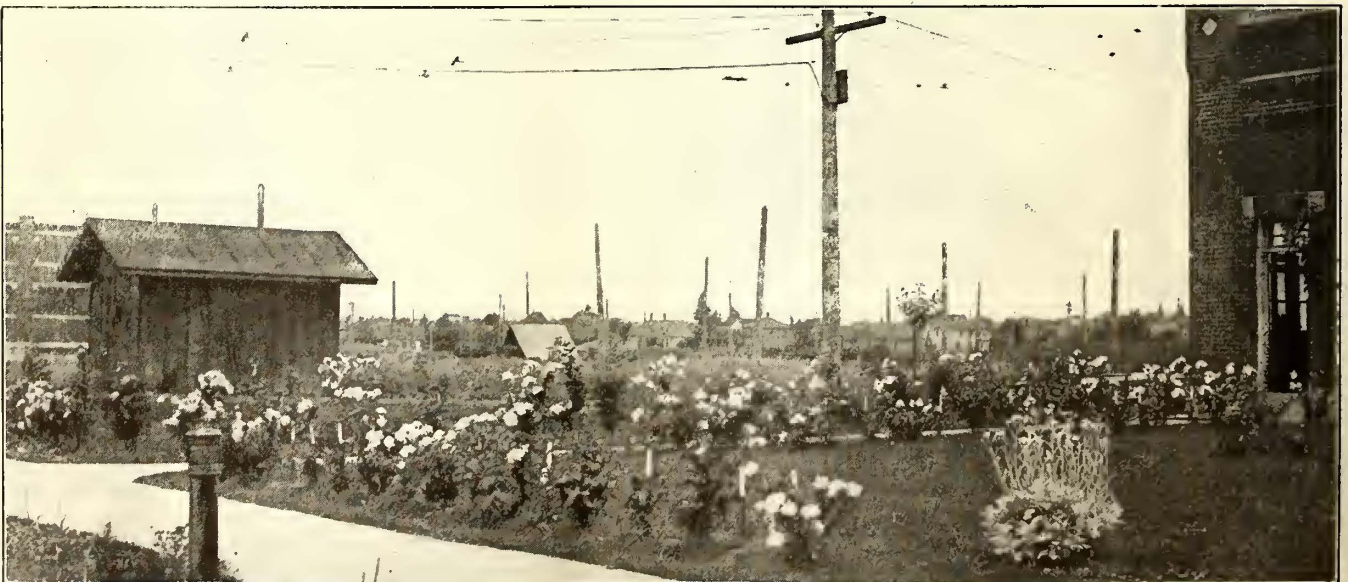
Master Mechanic Portland Railway, Light & Power Company

THE north building of the group comprising the repair shops of the Portland Railway, Light & Power Company has a frontage of about 240 ft. and stands back 80 ft. from the street. Until two years ago this approach was a rough gravel patch, a thrifty bunch of weeds here and there being the only ornamentation. A glance at the illustrations will show what a change has been made since the idea was conceived that this space might be turned into a flower garden.

A cement walk leads from the building to the street, and on each side of this walk a square about 80 ft. on a side was formed. The top layer of stones, weeds and gravel was removed and a layer of good soil taken from the company's land was laid in its place. This earth was well mixed with fertilizer obtained from cattle cars in the nearby freight yard. The squares were covered with fine sod and inclosed with a hedge of rose bushes. A few flower beds were made within these squares, and it was not long before the garden began to make a really creditable appearance.

From the very first the men showed their interest by bringing seeds, slips, bushes and bulbs, until at the present time there are tulips, daffodils, gladioli, phlox, cosmos, dahlias and more than a hundred rose bushes in this garden. Among the roses are the beautiful pink Caroline Testout, the official rose of Portland, and the magnificent, snow-white, Frau Karl Druschki, gorgeous J. B. Clarks and Ulrich Bruners, and many other choice varieties. We now have a constant succession of flowers for ten months of the year, all blooming with the profusion of growth peculiar to Portland vegetation. Many of the rose bushes have as many as fifty roses and buds in bloom at one time.

All of this work has been done without expense to the company, as the flowers have been donated and the garden is cared for by the shop men. The effect of this improvement is not restricted to the exterior, as there has been a noticeable change in the appearance of the interior of the buildings, the men seeming to take a greater pride in keeping the shops in a neat and orderly condition. Many of them show their interest in the garden by bringing their families to see the flowers on Sunday, or in the evening, and one of them expressed the general sentiment when he said: "It's a lot nicer to look at that beautiful garden than at an old gravel patch."



FLOWER GARDEN IN FULL BLOOM IN FRONT OF SHOPS OF PORTLAND RAILWAY, LIGHT & POWER COMPANY

Holding Company Traveling Experts

The Organization and Work of the Traveling Railway Specialists Recently Appointed by Henry L. Doherty & Company Are Described in This Article

ONE of the important advantages possessed by a holding company of the operating type is that, owing to the large volume of work handled, it can afford to employ more experienced and efficient operating men and engineers than could any of its constituent companies. Further, in a large organization there are usually a number of men who have worked and studied along certain lines until they are authorities of note in their respective fields. One of the problems confronting such a company is that of utilizing the talents of its specialists to best advantage. It has been thought, therefore, that a description of the plan recently adopted by Henry L. Doherty & Company, 60 Wall Street, New York, might be of general interest.

INAUGURATION OF THE PLAN

In the belief that a better utilization of the talents of the trained specialists in the organization would result in lower operating costs and increased safety, it was proposed at the meeting of the officials of the traction group of the Doherty interests, held in Chicago last May immediately before the annual convention of the National Electric Light Association, that some of the operating officials of the company who had special-

a traveling specialist bestows particular recognition on a man who, by careful study and hard work, has become a recognized authority in some field of endeavor. The fact that such recognition of merit is granted to deserving men furnishes an incentive for the younger men who aspire to the higher positions in the company to study and specialize on some particular line in connection with their regular work.

Briefly stated, the duties of these specialists are: To visit and inspect, with particular reference to their respective specialties, the several railway properties forming the Doherty traction group; to promote the use of standard methods, practices and equipments, and to advise the officials of local companies on special problems. They act chiefly in an advisory capacity; that is, they do their work as any outside consulting engineer would do it, making a report of their findings and a recommendation both to the local manager and to R. F. Carbutt of the New York office of the Doherty interests, who, as railway engineer for the company, has the general supervision of their work as traveling specialists. They are expected to write up their report on a property which has been inspected before they leave the property, so that all details will be fresh in

(Name of Company)								
Total Car Miles		Cost of Railway Car Material			1916			
Material	Total Cost	Cost per 1000 Car Miles	Miles per Unit	Manufacturer of Material	Type & Kind of Material	Unit Cost Including Freight	Date of Purchase of Material	Size of Material
Armature Coils								
Babbitt (Armature)								
.. (Bearings)								
Brake Shoes								
.. Heads			Per Shoe					
.. Accessories								

BLANK FORM USED BY TRAVELING SPECIALISTS FOR COMPILING COST DATA

ized along certain lines be appointed traveling railway specialists. The managers of the several properties approved the plan and took steps to put it into action at once. So far two appointments have been made: Albert Swartz, vice-president Toledo & Western Railway, has been appointed traveling track specialist, and Arthur Brown, master mechanic, Toledo Railways & Light Company, traveling master mechanic. These appointments were noted in the news columns of the ELECTRIC RAILWAY JOURNAL of June 10, 1916.

SELECTION OF SPECIALISTS

In the selection of these specialists it was felt that it would be a blunder to remove them permanently from their present positions and thus deprive their properties of their regular services. It seemed best, therefore, to continue them in their regular positions but to give them opportunities to get away occasionally. The plan of appointing regular operating men for such positions has several advantages to commend it. The men selected as specialists are fresh from the firing line, as it were, and the problems they are advising on are their own problems, solved or to be solved, whichever the case may be. Their viewpoint is that of the operating man, and as a result they do not tend to belittle the local problems which are bothering the officials of subsidiary companies. An appointment as

mind while the report is being written. The expense of inspection is charged against the local company just as it would be had the work been done by an outside party. Occasionally some special problem requiring time for its solution may be brought to their attention. In such cases, the work in connection with the problem is carried on by the local people, who keep the traveling specialist informed of its progress.

Visits to the several properties are not scheduled, the traveling specialist using his own judgment in the matter and selecting a time when he can best get away from his own property. Two or three days are ordinarily spent in the inspection of a single property. The specialist usually tries to inspect several properties in the course of one trip, and to economize time groups them geographically. A few days before starting out he telegraphs the managers of the properties he is planning to visit, notifying them of his schedule. The advance notice enables local officials to formulate the problems on which the advice of the specialist is desired.

WHAT THE SPECIALISTS ARE DOING

In their inspections this year the specialists are paying particular attention to standardization matters. In the operation of isolated properties it is often the case that methods and practices, particularly those of a minor nature, differ considerably. Standardization

LIST OF THE DOHERTY RAILWAY PROPERTIES

Name of Company.	Location.
Amarillo Street Railway.....	Amarillo, Tex.
Athens Railway & Electric Company.....	Athens, Ga.
Bartlesville Interurban Railway.....	Bartlesville, Okla.
City Light & Traction Company.....	Sedalia, Mo.
Cumberland & Westernport Electric Railway.....	Frostburg, Md.
Durham Traction Company.....	Durham, N. C.
Hattiesburg Traction Company.....	Hattiesburg, Miss.
Meridian Light & Railway.....	Meridian, Miss.
St. Joseph Railway, Light, Heat & Power Company.....	St. Joseph, Mo.
St. Joseph & Savannah Interurban Railway.....	St. Joseph, Mo.
Manhattan & Queens Traction Corp.....	Long Island City, N. Y.
Toledo Group.....	Toledo, Ohio
Adrian Street Railway	
Maumee Valley Railway & Light Company	
Toledo, Ottawa Beach & Northern Railway	
Toledo Railways & Light Company	
Toledo & Western Railway.	

cuts down overhead expenses, lessens the investment in stockroom material, facilitates inspection and repairs, and makes buying on a larger scale possible.

To facilitate their study of a given property, the specialists make use of a table of cost data showing costs of the various items for the current year and for the year preceding. A blank form of the kind used for listing the cost of car material used in maintenance work is shown in the illustration on page 491. The material is listed under the main headings of: Armature coils, babbitt (armature), babbitt (bearings), brake shoes, brake heads, brake accessories, brushes and brush holders, carwheels, commutators, field coils, fuses, gear grease, gear pinions, gear wheels, glass, incandescent lamps, lubricants, motor repairs, sand, soap for car cleaning, trolley springs, washers and harps, tape, trolley poles, trolley wheels, and waste.

A study of such a table of maintenance costs enables the specialist to pick out items for which either a considerable increase or decrease in maintenance cost has been made. Also from his knowledge of maintenance costs in general he can select the items that appear either excessively low or high. An increase in cost of maintenance of a particular item is investigated to see whether it is due to some method which is producing results no better than were formerly obtained.

A decrease is investigated to see that results as good as formerly obtained are being secured and to be sure that the results secured by the cheaper process in no way militate against safety in operation. If costs for both years are excessively high, the methods are examined to see how they can be changed so as to secure as good results at a lower cost. If costs seem to be lower than the specialist thinks they should be, an examination is made to see whether the low costs are due to an attempt to get too much wear out of a given piece of equipment, and thus affect the safety of operation and possibly the cost of maintenance of some other equipment item. For example, a very low maintenance in car wheels might mean that the flanges were being worn until they were very thin, thus increasing the danger of derailments and damage to track and special work. Excessive brakeshoe costs might be due to the use of a shoe not suitable to the local conditions. In such a case the specialist, from his wide knowledge of the subject, recommends a suitable type of shoe.

In the work already done the specialists have been able to advise changes in methods and practices which will result in annual savings to one local company of several thousands of dollars per year on a single item. On many items the standardization of methods and the advice of the skilled experts will result in only small savings. However, a number of small savings in each of the companies aggregates a large total when all the companies are considered. In some cases the specialists advise greater expenditures in maintenance because, in line with the broad policies of the Doherty Organization, safety of operation is placed above cost.

Mr. Swartz has already inspected the properties lo-

cated at Amarillo, Tex.; Sedalia, Mo.; Athens, Ga.; Durham, N. C.; St. Joseph, Mo.; Hattiesburg, Miss.; Meriden, Miss., and Bartlesville, Okla. He will inspect the Cumberland & Westernport and the Manhattan & Queens properties some time this summer. In this his first round of inspections he has been placing special stress on the subjects of rail bonding, tie spacing, track grinding and street paving.

Mr. Brown has not had much time to give to the work as yet, but he is planning to inspect the Cumberland & Westernport and Manhattan & Queens properties at an early date. The work he has done so far indicates that the greatest savings will be on the items of brake shoes and car accessories. It is anticipated also that there will be a material increase in safety of operation as a result of his inspections.

The managers of local properties are, of course, not bound to follow the advice of the traveling experts, but as it is up to them to make good on their respective properties, they have been very glad to receive any information which enables them to render better service at the same cost or the same service at a lower cost. The results of the work of these specialists so far has been so satisfactory that the appointment of a traveling traffic study specialist is being urged. His appointment would not mean that extensive traffic studies would be made on the different properties, but studies of the relation of the traffic to the car schedules would be instituted in an endeavor to cut down the empty-seat mileage without reducing the quality of the service.

Railway Signal Association Meets

The annual convention of the Railway Signal Association was held at the Grand Hotel, Mackinac Island, Mich., Sept. 12-14, 1916. During the convention there were presented a number of reports of committees, among which was a special committee on harmonizing specifications and standing committees on signaling practice, standard designs, wires and cables, storage battery and charging equipment, direct current relays and power interlocking. An amendment to the constitution was also submitted and passed, thus raising the dues for the active and associate members of the association to \$4 per annum. Progress reports were presented also by the committees on maintenance and operation and on electrical testing.

The committee on electric railway and alternating current signaling presented specifications for alternating-current relays and for single-phase line transformers of the oil-immersed, self-cooled, outdoor-type designed for 4400 volts or less. This committee also submitted descriptive matter on alternating-current signaling, including a technical account of the resonant shunt used for shunting out from signal apparatus heavy currents of frequencies other than that for which the system is designed. A number of brief outlines were presented to place on record data covering signal installations made upon steam and electric railways that use alternating-current signals. All of the installations thus referred to, with the exception of a few of one or two blocks' length each, have been described in past issues of the ELECTRIC RAILWAY JOURNAL. Reports were also received from standing committees on direct-current automatic block signaling and mechanical interlocking.

At the annual election of officers, Charles A. Dunham, Great Northern Railway, was made president; R. E. Trout, St. Louis & San Francisco Railroad, was elected second vice-president; W. H. Elliott, New York Central Railroad, having been made first vice-president without action. C. C. Rosenger was re-elected secretary-treasurer of the association for the coming year.

Electric Service Over the Rockies

A unique method of calling the attention of the traveling public to the electric service over the Rocky Mountains by the Chicago, Milwaukee & St. Paul Rail-



ELECTRICALLY OPERATED OVER THE ROCKIES
CHICAGO, MILWAUKEE & ST PAUL RAILWAY

way is shown by the accompanying illustration. This is taken from the letterhead of the stationery on the observation car of the "Olympian," which is one of the transcontinental trains operating between Chicago, Ill., and Seattle, Wash., over this route.

Annual Report of National Safety Council

The third annual report of the secretary of the National Safety Council states that 1102 new members have been gained during the past year, an increase of 91 per cent, the present membership being 2020, with more than 10,000 representatives and 3,500,000 employees. The income from dues for the year was \$46,000 and the present surplus is \$4,600. At the present rate the income for the calendar year 1916 will approximate \$70,000.

More than 3,000,000 copies of over 270 different pieces of printed matter have been sent out. Last year the annual congress was attended by more than 1700 representatives, fifteen sections were organized and an instructive exhibit was conducted. The council spent more than \$5,000 on the congress. The information bureau is now well organized and there are two librarians in charge. Among the features of the work have been special and traveling exhibits, safety meetings in the plants of members, a new series of "Safe Practices Information Leaflets," co-operation in establishing a national fire and accident prevention day, etc. A field secretary has been engaged who started work on Sept. 1, and the staff now includes an editor.

The nominating committee has also presented its report. Among the nominations to directorships is that of Edward C. Spring, manager Lehigh Valley Transit Company, Allentown, Pa.

Difficulties of New York Commission in Subway Construction Work

During construction of the new rapid transit railroads in New York City under the dual system contracts, the Public Service Commission for the First District has had to engage in many varied forms of activities. New streets have been laid out, bridges have been built, railroad tracks have been moved, tunnels built, new foundations have been placed under some of the tallest of Manhattan's skyscrapers, buildings have been cut in half, one five-story apartment house has been moved a considerable distance and placed on a new foundation, and in one instance a fire-engine house was floated bodily down the Harlem River and set in a new location. The commission's engineers are now to engage in a new venture, being no less than the changing of the course of a running stream—Downing Brook—which runs through a portion of Bronx Park. At one point the stream crosses the park line three times, and at each of these crossings runs through property which is soon to be used

for a yard for the storage of subway cars of the Interborough Rapid Transit Company. The course of the stream is to be diverted entirely within the park area, at present as an open running stream, but eventually it is to be diverted into a new trunk sewer which is now under construction.

Electric Locomotives on the "Booster Special"

Special Train from Charles City to Cedar Rapids Hauled Over Four Lines by Five Locomotives

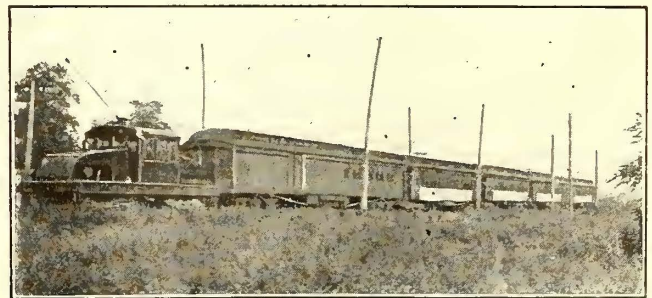
IN connection with a gas tractor demonstration held last month in Cedar Rapids, Iowa, a tractor manufacturer of Charles City arranged to run a special train of four coaches and a baggage car from the latter city to the show grounds in the former for the purpose of transporting a large company of boosters. To enhance the advertising value of this trip, the train was routed over the local electric lines as far



TRACTOR SPECIAL HAULED BY LOCOMOTIVES OF CEDAR VALLEY LINES

as possible, using the steam lines for the remainder of the trip. The total length of the trip was 125 miles.

The train left the station of the Charles City Western Railway in Charles City, Iowa, at 6 a. m., a buffet lunch being served in the baggage car. From Charles City to Marble Rock it was hauled over the Charles City Western Railway, a recently electrified 1200-volt direct-current line for which power is purchased from the Cedar Valley Light & Power Company. An electric locomotive used by the railway for



TRACTOR SPECIAL AT MARBLE ROCK, WITH LOCOMOTIVE OF CHARLES CITY WESTERN RAILWAY

freight service hauled the train. At Marble Rock the train was picked up by a steam locomotive and taken over the Rock Island Railroad to Cedar Rapids, where it was coupled to a steam locomotive on the Chicago, Milwaukee & St. Paul Railway. The last named shifted the train to the lines of the Waterloo, Cedar Falls & Northern Railway, the "Cedar Valley Lines," where two 600-volt electric locomotives were coupled to it and hauled it to the show grounds, which it entered to the music of a forty-piece band brought from Charles City.

Medical Examinations of Employees*

The Author Explains the Many Advantages of Such Examinations When Employees Are Engaged and Outlines the Essential Requirements

By DR. CHARLES H. LEMON

Chief Surgeon, Milwaukee Electric Railway & Light Company

MODERN business differs from that of a quarter of a century ago in many particulars. Under the old order, the man was not considered as an entity. He came and went as the needs of the business demanded. His relation to his employer was a negative one. His joy and his sorrow were shared by no one, and the tenure of his position was dependent largely upon the whim of his immediate boss. The corporation was without a soul, and in the keen competition which necessarily occurred the man was lost sight of.

In the development of modern business, with its very humane interest in the welfare of its employees, we find the railroads many years in advance of the other industries. Until within a few years no voluntary medical services were offered injured employees in our great American industrial establishments. How different from the very beginning of their corporative lives has been the practice of the railroads in taking care of their wounded employees. They have recognized for more than a half century that injuries incident to operation were properly chargeable to the cost of operation.

Railroad surgeons have been identified in the public mind with the operation of railroads ever since railroading began. The general supervision of the health of the employees, which follows as a corollary the general employment of physicians throughout a large railway system, is a fact of importance that should not be lost sight of. The friendly suggestion by the doctor to the man who is in failing health is the human touch of the corporation.

ADVANTAGES OF EXAMINATION SET FORTH

In a diversified business such as ours the man seeking employment will represent every possible variety of human activity, from the illiterate foreigner who applies as a laborer to the highly trained engineer or accountant. For the particular department or bureau that is applied to there must be certain characteristics of mind and body that are required in the average man, and these necessary qualifications we have summarized in a group, and we call them "specifications." The applicant himself has by a process of self-elimination placed himself in a particular group when he applies to a specific department for employment. It is true he may be mistaken in his estimate of his ability, but we must at least recognize that he has specialized in his own case. This type of man, to my mind, is highly desirable, because in all but the lowest types of labor, where the bare necessities of life force the man into activity, we have the elementary idea of fitness expressed.

The purpose of specifications is not to bring a stumbling block to well intentioned applicants for employment. It is rather to standardize the type of man who shall form a group in order that the group may become efficient. The nearer the individuals of the group approach the specifications, the greater will be the effect of their team work.

In an exhaustive study of the changing personnel among trainmen, R. B. Stearns, vice-president Milwau-

kee Electric Railway & Light Company, prepared a comprehensive report, July 18, 1914, under the caption, "Recession Rate Among Trainmen and Estimated Average Annual Cost Properly Chargeable Against the Changing Personnel." This analysis of conditions among trainmen shows that the greatest loss from resignation occurs in the first two years of the service, and that after the third year the trainman has reached a condition of stability and the percentage of loss from resignation or discharge is exceedingly small. In this report Mr. Stearns gives a table to show average annual cost properly chargeable to the 433 trainmen in the service one year or less at that time (1913). The table follows:

TABLE SHOWING ANNUAL COST OF CHANGING PERSONNEL,
MILWAUKEE, 1913

	Year 1913	Cost per Trainman in Service
(a) Practice money, at \$10 each.....	\$6,340	\$14.64
(b) Wages paid conductor instructors.....	1,408	3.25
(c) Wages paid regular instructors (75 per cent)	3,330	7.69
(d) Rent of instructors' room (75 per cent)	270	0.63
(e) Cost of accidents and investigation.....	146,475	338.28
(f) Cost of damage to cars.....	2,573	5.94
	\$160,396	\$370.43

It may be concluded from the above that more care in the selection of employees to determine their relative fitness for the position, temperamentally as well as physically, may operate to effect a better class of employees and thus reduce the recession rate. This suggests the consideration of an employment bureau, wherein a careful study of the qualifications of each applicant may be made and a follow-up system inaugurated to inquire into the applicant's previous record and experience, and associate his fitness for the position with his physical, mental and temperamental qualifications. Such a bureau if properly organized might well act for all departments, and thus not only relieve the superintendent of transportation of the selection of several hundred employees annually, but relieve other departmental heads of similar burdens as well.

It will be seen, for instance, in the case of trainmen who have been in the service less than one year, that it is probably far less expensive to retain the services of an employee in the case of minor offenses of discipline during his early period of service than to discharge or allow him to resign, providing other necessary qualifications and fitness for the position have been demonstrated to be reasonably satisfactory.

It cannot, therefore, be successfully contended that the interest of the company is other than to find the man for the job and then train him for high efficiency and retain him in the service. We may infer from the relatively high recession rate which is probably characteristic of most other transportation companies, that the man who seeks the employment in nearly one-half of the cases does not do so from a firm conviction that he is fitted for the service, but rather to serve some temporary need or to fill in a gap while waiting for something to turn up. An employment bureau that could eliminate a fair percentage of these floaters would serve a most desirable purpose. The physical test will

*Abstract of paper read at Milwaukee Company Section, Oct. 28, 1915.

eliminate a considerable percentage of applicants, and if any plan can be devised which will make their employment more attractive, such as has been the case in the last few years in this company, the recession rate hoped for by Mr. Stearns should become possible.

In the foregoing discussion we have seen that the employer will have to look about him to find the man suitable for the work in hand. We must assume that the head of a department has the best interest of his company at heart and will not employ a man who is manifestly incompetent, or who, by reason of manifest physical defects, could cause undue hazard. When labor is scarce and the management, because of the necessities of the business, holds the head of the department to an average, rather than to a high rate of pay, the temptation will become great to employ men who are physically below the average.

CHARACTER OF EXAMINATIONS

The work of the surgeon in these examinations must be absolutely impartial. It must not be so rigid in its interpretation that none but the most perfectly endowed will be able to pass. Above all, he should keep himself clear of fads, which are the bane of the medical profession, and his decision, after a careful investigation of the applicant, should be based upon actual findings rather than upon preconceived opinions. Sound lungs; a sound heart that will not flag under severe strain; a frame well knitted together; vision, at least normal in extent; hands and feet without deformity; an erect carriage; eyes which look you straight in the face; a step that is elastic, and a body free of any general blood taint; these are some of the qualifications that we must hope to attain in the average employee.

Many men who come to the examination, and to the office of a physician for the first time are visibly nervous. For such a few minutes of general conversation, which will give the applicant an opportunity to get his bearings, will frequently quiet down a heart whose beatings can almost be heard through the chest wall. That there will be a definite number of rejections, especially for the train service, goes without saying.

It is the duty of the medical examiner to stand firmly upon the result of his examination. To be influenced by the head of a department, who pleads for leniency because of the dearth of available material, is a confession of weakness. I do not think the opinion of the company's surgeon should be a last word for the departmental heads. There are times and circumstances which should justify the employment temporarily of men rejected by the medical department. The burden of the responsibility, however, should rest upon the departmental head exercising this right, and he should exercise this right only under conditions which he would feel justified in assuming that the management of the company would sanction.

It might be of interest to here briefly recite the physical requirements and characteristics necessary to employment:

1. *Age*.—Acceptable applicants for employment shall be eighteen to forty-five years old, except temporary employees, who may be employed up to fifty-five years of age. Messengers, office boys and minor clerks under the age of eighteen years may be employed by direction of a departmental head. No one shall be employed under sixteen years of age, excepting with the approval of the proper civil authorities.

2. *Height and Weight*.—Height shall be suited for the particular class of work. The weight shall correspond in general with the normal weight for the age and height, as shown by the standard table, but a variation of a maximum of 20 per cent over or 20 per

cent under weight, as indicated on the table, may be permitted when other conditions are favorable. Special requirements shall be given due consideration.

Essential Physical Requirements

The following qualities will be required in all employees except in special cases where specific exceptions are provided:

3. Two good eyes.
4. Ten fingers free from deformity.
5. Arms that move freely at wrist, elbow and shoulder.
6. Legs of equal length, freely movable at the hip, knee and ankle.
7. Feet without broken arches, known as "flat-feet."
8. An elastic or springy gait.
9. Well developed chest.
10. Sound teeth.
11. Good hearing.
12. General appearance of good health.

Medical Requirements

13. No person who is a "consumptive" or who has lived in the same house with a "consumptive" within one year, shall be employed.

14. No person having venereal disease shall be employed.

15. No person with a history of "fits" or "convulsions" shall be employed.

16. No person with a habitual headache shall be employed.

17. Persons wearing glasses should not be employed except for clerical or technical positions.

18. Where a person is known to be color blind he should not be employed, as a color-blind person would not recognize a red "danger" signal.

19. No person having a hernia, varicose veins or "open sores" shall be employed.

20. No person with a spinal or other gross deformity shall be employed.

21. No person with an active skin disease shall be employed.

22. No person giving a history of mental or nervous disease shall be employed.

23. Every applicant before being employed must pass a satisfactory medical examination.

24. Manifest defectives should not be sent to the medical department for examination.

25. Employment cards should state the exact character of employment of individuals in order that the medical department may be advised as to the special medical tests required for various occupations, such as trainmen, linemen, teamsters, clerks, etc.

In addition to the foregoing essential qualifications necessary to employment, due consideration and weight are also given to personal appearance, social conditions and education and training.

No records are kept in the medical department of men applying for temporary employment, because of the enormous amount of clerical work involved. Excluding common laborers, these temporary employees represent largely a floating class, and many physical defects are found among them. Departmental heads not infrequently make permanent these temporary employees, and when they submit themselves for examination before admittance into the Employees' Mutual Benefit Association, a record is then obtained.

As applying to applicants for employment in the transportation service, it might be stated that approximately 40 per cent of those undergoing physical examination are rejected, principally on account of defective vision or for hernia.

1916 CONVENTION
ATLANTIC CITY
OCTOBER 9 TO 13

ASSOCIATION NEWS

1916 CONVENTION
ATLANTIC CITY
OCTOBER 9 TO 13

Programs for Accountants', Engineering, Claims and Transportation & Traffic Associations Are Given
—Also Notes on Meetings of Valuation and Entertainment Committees, and
Revised Chicago Special Train Schedule

Programs for the Convention

Secretary E. B. Burritt has just announced the following tentative programs for the Atlantic City convention. The American Association program appeared in the issue of the *ELECTRIC RAILWAY JOURNAL* for Aug. 12, 1916, page 280.

PROGRAM OF ACCOUNTANTS' ASSOCIATION

Monday, Oct. 9

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at registration booth.

2 p. m. to 5 p. m.

Meeting held in Accountants' Hall

Convention called to order.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees.

- (a) Resolutions,
- (b) Nominations.

Reports of committees:

- (a) Accounting definitions,
- (b) Standard classification of accounts,
- (c) Representing Association at Convention of Railroad Commissioners.

Paper on "The Statistician," by W. E. Jones, statistician, The Connecticut Company, New Haven, Conn.

Paper on "Commission Valuation of Public Service Properties for Purposes of Rate Regulation," by John E. Benton.

Tuesday, Oct. 10

2 p. m. to 3.30 p. m.

Joint session with Engineering Association

Meeting held in Engineers' Hall

Reports of committees:

- (a) Engineering-Accounting,
- (b) Life of Railway Physical Property.

3.30 p. m. to 5 p. m.

After joint session, meeting held in Accountants' Hall

Address on "Commission Accounting Inconsistencies," by Homer A. Dunn, C.P.A., Haskins and Sells, Certified Public Accountants.

Paper on "The Federal Census of Electrical Industries," by William H. Steuart, chief statistician for manufactures, Department of Commerce, Bureau of Census, Washington, D. C.

Wednesday, Oct. 11

2 p. m. to 5 p. m.

Joint session with Transportation & Traffic Association
Meeting held in Greek Temple

Reports of committees:

- (a) Cost of rush-hour service,
- (b) Fares and transfers.

Prepayment Systems—General Discussion.

Reports of committees:

- (a) Express and freight traffic.

Address on "Some National Issues in Local Street Railway Franchises," by Clyde L. King, professor in the University of Pennsylvania, Philadelphia, Pa.

Reports of committees:

- (a) Passenger, express and freight accounting.

Thursday, Oct. 12

2 p. m. to 2.30 p. m.

Joint session with Claims Association

Meeting held in Accountants' Hall

Reports of committees:

- (a) Claims-Accounting.

2.30 p. m. to 5 p. m.

After joint session

Address on "The Part which Accounting has Played in the Development of Modern Industry," by John R. Wildman, professor in New York University, New York, N. Y.

Reports of convention committees:

- (a) Resolutions,
- (b) Nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF ENGINEERING ASSOCIATION

Monday, Oct. 9

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at registration booth.

2 p. m. to 5 p. m.

Meeting held in Engineers' Hall

Convention called to order.

Annual address of the president.

Annual report of executive committee.

Annual report of secretary-treasurer.

Appointment of convention committee:

- (a) Resolutions.

Reports of committees:

- (a) Power distribution,
- (b) Standards (on recommendations contained in report),
- (c) Special subcommittee on stranding table,
- (d) Committee on standards,

Tuesday, Oct. 10

2 p. m. to 3.30 p. m.

Joint session with Accountants' Association

Meeting held in Engineers' Hall

Reports of committees:

- (a) Engineering-Accounting,
- (b) Life of railway physical property.

3.30 p. m. to 5 p. m.

Joint session with Transportation & Traffic Association
Meeting held in Greek Temple

Reports of committees:

- (a) Block signals for electric railways,
- (b) Standards (on recommendations contained in above report),
- (c) Transportation-Engineering.

Wednesday, Oct. 11

2 p. m. to 5 p. m.

Meeting held in Engineers' Hall

Reports of committees:

- (a) Power generation,
- (b) Standards (on recommendations contained in above report),
- (c) Way matters,
- (d) Standards (on recommendations contained in above report),
- (e) Report of delegates to Good Roads Congress.

Thursday, Oct. 12

2 p. m. to 5 p. m.

Meeting held in Engineers' Hall

Reports of committees:

- (a) Equipment,
- (b) Standards (on recommendations contained in above report).

Paper on "Lighting of Cars."

Reports of committees (continued):

- (c) Buildings and structures.

Friday, Oct. 13

2 p. m. to 5 p. m.

Meeting held in Engineers' Hall

Reports of committees:

- (a) Heavy electric traction,
- (b) Standards (on recommendations contained in above report),
- (c) Electrolysis.

General business.

Report of committee on resolutions.

Report of committee on nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF TRANSPORTATION & TRAFFIC ASSOCIATION

Monday, Oct. 9

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at registration booth.

2 p. m. to 4.30 p. m.

Meeting held in Greek Temple

Convention called to order.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) Resolutions,
- (b) Nominations.

Reports of committees:

- (a) Standards,
- (b) Construction of schedules and time-tables.

Paper on "Development of Schedule Makers," by H. C. Donecker, assistant general manager, Public Service Railway, Newark, N. J.

4.30 p. m. to 5 p. m.

Joint session with Claims Association

Reports of committees:

- (a) Claims-Transportation.

Tuesday, Oct. 10

2 p. m. to 3.30 p. m.

Meeting held in Greek Temple

Reports of committees:

- (a) Passenger traffic,
- (b) Uniform definitions.

Paper on "Training Men for Supervisory and Executive Positions," by L. C. Bradley, assistant district manager Stone & Webster, Houston, Tex.

3.30 p. m. to 5 p. m.

Joint session with Engineering Association

Reports of committees:

- (a) Transportation-Engineering,
- (b) Block signals,
- (c) Standards (Engineering).

Wednesday, Oct. 11

2 to 5 p. m.

Joint session with Accountants' Association

Meeting held in Greek Temple

Reports of committees:

- (a) Cost of rush-hour service,
- (b) Fares and transfers.

Prepayment systems—General Discussion.

Reports of committees:

- (a) Express and freight traffic,
- (b) Passenger, express and freight accounting.

Thursday, Oct. 12

2 p. m. to 5 p. m.

Meeting held in Greek Temple

Reports of committees:

- (a) Rules.

"Company Publications":

- (a) "Their Use and Value": F. W. Hild, general manager Denver (Col.) Tramway.
- (b) "Their Preparation and Publication": Leake Carraway, Southern Public Utilities Company, Charlotte, N. C.

General discussion.

General business.

Report of committee on resolutions.

Report of committee on nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF CLAIMS ASSOCIATION

Monday, Oct. 9

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at registration booth.

2.30 p. m. to 4.30 p. m.

Meeting held in Claims Hall

Convention called to order.

Annual address of acting president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) Resolutions,
- (b) Nominations.

Reports of committees:

- (a) Employment,
- (b) Ways and means.

Paper on "Workmen's Compensation Acts," by Roy C. Green, accident department Cleveland (Ohio) Railway.

Written discussion: L. S. Hoffman, general solicitor Public Service Railway, Newark, N. J.

General discussion.

4.30 p. m. to 5 p. m.

Joint session with Transportation & Traffic Association

Meeting held in Greek Temple

Reports of committees:

- (a) Claims-Transportation.

Tuesday, Oct. 10

2.30 p. m. to 5 p. m.

Meeting held in Claims Hall

Paper on "Near Side Stop," by John P. Reynolds, claim agent, Boston (Mass.) Elevated Railway.
 Written Discussion: S. B. Hare, claim agent, Altoona & Logan Valley Electric Railway, Altoona, Pa.
 General discussion.

Wednesday, Oct. 11

2.30 p. m. to 5 p. m.

Meeting held in Claims Hall

Paper on "Automobile Accidents and Traffic Regulations," by H. G. Winsor, superintendent of investigation and adjustments, Puget Sound Electric Railway, Tacoma, Wash.
 Written discussion: A. G. Brown, claim agent, New York State Railways, Syracuse, N. Y.
 General discussion.

Thursday, Oct. 12

2 p. m. to 2.30 p. m.

Joint session with Accountants' Association
 Meeting held in Accountants' Hall

Reports of committees:

(a) Claims-Accounting.

2.30 p. m. to 5 p. m.

After joint session

Meeting held in Claims Hall

Paper on "Claim Work": (a) "Claim Agent—Past, Present and Future," (b) "Policies and Principles," (c) "Psychology," by E. P. Walsh, attorney United Railways, St. Louis, Mo.
 Written discussion: C. G. Rice, assistant to general manager, Pittsburgh (Pa.) Railways, Pittsburgh.
 General discussion.
 General business.
 Report of committee on resolutions.
 Report of committee on nominations.
 Election of officers.
 Installation of officers.
 Adjournment.

Chicago Convention Train Time Changed

A canvass of the members of the A. E. R. A. transportation committee for Illinois and Wisconsin, as well as a number of railway officials in that district, resulted in the change of the schedule of the Chicago special train to the Atlantic City convention. Instead of leaving from the Chicago Pennsylvania terminal on Saturday, Oct. 7, the time will be 11 a. m. Sunday, Oct. 8. The schedule and connections will be as follows:

Leave Chicago	11.00 a. m.	Leave Mansfield, Ohio	6.00 p. m.
Leave Fort Wayne, Ind.	2.30 p. m.	Leave Canton, Ohio	7.40 p. m.
Leave Lima, Ohio.	3.50 p. m.	Leave Pittsburgh, Pa.	11.40 p. m.
Leave Crestline, Ohio	5.30 p. m.	Leave Harrisburg, Pa.	6.00 a. m.
		Arrive Atlantic City..	9.30 a. m.

Connections with the "Special" can be made as follows:

Leave Detroit (Michigan Central Railroad)	11.55 a. m.
Leave Toledo (Pennsylvania Company)	2.10 p. m.
Arrive Mansfield	4.30 p. m.
Leave Cleveland (Pennsylvania Company)	5.30 p. m.
Arrive Pittsburgh	9.40 p. m.

Valuation Committee

At a meeting of the American Association committee on valuation held in New York on Sept. 8 a paper by P. J. Kealy on "Overhead Charges in Valuation" was approved as a reasonable statement of one phase of the

general subject. This is the paper referred to on page 280 of the issue of this journal for Aug. 12. It will be presented on Tuesday, Oct. 10. The committee also considered a code of valuation definitions prepared by C. G. Young, of the committee. Twenty-one definitions were adopted for presentation to the convention.

The meeting was attended by J. N. Shannahan, Newport News & Hampton Railway, Gas & Electric Company, chairman; P. J. Kealy, Kansas City Railways; Martin Schreiber, Public Service Railway; B. E. Tilton, New York State Railways, and C. G. Young, consulting engineer, New York City.

The Association and the Eight-Hour Bill

At association headquarters there have been received many commendations of the work of the committee on federal relations in securing the exemption of electric railways from the burdens imposed by the bill recently passed by Congress. (See issues of the ELECTRIC RAILWAY JOURNAL for Sept. 2, page 404, and Sept. 9, page 461.)

Entertainment Committee

A meeting of this committee was held in New York on Sept. 14. The entertainment program was considered, the estimate of the necessary appropriation was approved, the sub-committees were appointed and other sundry details were considered. The committee members in attendance were: E. F. Wickwire, Ohio Brass Company, chairman; W. Caryl Ely, Ohio Valley Finance Company; R. F. Hayes, Curtain Supply Company; W. G. Kaylor, Westinghouse Air Brake Company; H. N. Ransom, Westinghouse Electric & Manufacturing Company; J. N. Shannahan, Newport News Railway, Gas & Electric Company; E. P. Waller, General Electric Company; and B. F. Wood, United Gas & Electrical Engineering Corporation. W. T. Stanton, General Electric Company, also attended by invitation.

Treatment of Fence Posts for Maintenance Work

The American Railway Engineering Association Bulletin No. 187 has just been issued. A portion of the bulletin devoted to service tests of treated and untreated fence posts sets forth the results obtained by the United States Forest Service in co-operation with various state agricultural experiment stations which have been conducting a series of experiments on posts installed from 1906 to 1909.

These tests were conducted at experiment stations in South Carolina, Alabama, Louisiana, Iowa, Minnesota and Maryland. The conclusions drawn as a result of the experiments up to the time of preparing the article show that nondurable species, especially in the South, should have at least a light top treatment in addition to the heavier butt treatment. Brush treatments, soaking in cold-oil and double-tank treatments, where asphaltum was used as the heating media in the hot bath, were not very effective in preventing decay. Charring was apparently of no value, and care must be taken to have the butt treatment extend well up above the ground line. The results clearly indicate that a good open-tank treatment of fence posts with creosote will give satisfactory results in preventing decay in most of the non-durable species. Posts treated with water-gas-tar creosote and water-gas-tar have stood up very well thus far. Those treated with the creosote are in somewhat better condition than those treated with tar.

COMMUNICATIONS

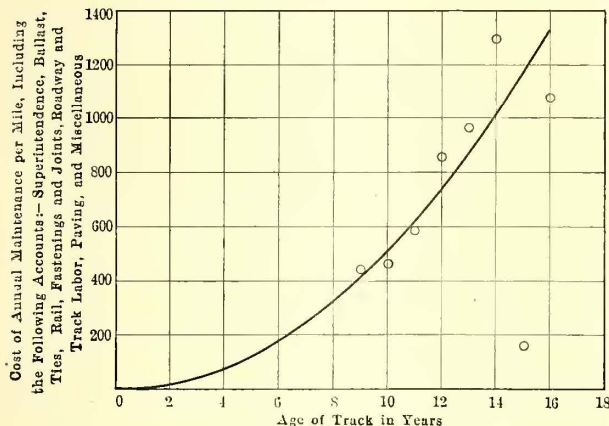
Unit for Comparing Track Upkeep Costs

NEW YORK STATE RAILWAYS
ROCHESTER, N. Y., Sept. 7, 1916.

To the Editor:

I note with interest the editorials appearing in your issues of Aug. 12 and Aug. 19 on the subject of "A Unit for Comparing Track Maintenance Costs." This is a very interesting subject and one which, if taken up and developed by the American Electric Railway Association through a committee or sub-committee, should lead to considerable economy in maintenance of track, as it is only through a study of unit costs that more efficient methods can be developed. However, the establishing of a unit cost of track maintenance is a very difficult matter on account of the variables which enter into the problem. My interest in this matter prompts me to set down a few of the ideas which I have on this subject in the hope that others may do the same, resulting in some advance along this line through the interchange of thought.

There are in general three factors which should be taken into consideration in determining the cost of track maintenance. These three factors are as follows: The interest on the original construction cost; the



GRAPH SHOWING RELATION IN ONE INSTANCE BETWEEN COST OF MAINTENANCE AND AGE OF TRACK

Paving, Medina block. Rail, L.S. 107-333 (9-in. Trilby). Ties, untreated oak and chestnut. Ballast, concrete. Joints, electric weld. Traffic during fifteenth year, 111,300 trips city cars, 12,360 trips interurban cars.

annual depreciation or renewal fund, and the actual money spent on labor and materials to keep the track in usable condition during its life. The only costs ordinarily used in comparing maintenance is the third, that is, the cost of labor and materials to keep the track in a usable condition.

There is an old adage to the effect that "A stitch in time saves nine," and this applies to track as well as other things. If money is spent making track repairs promptly there will be considerable life added to the track, and this in turn will decrease the depreciation figure or renewal fund. Thus it will be seen that these two are interdependent and that a comparison of either without considering the other is liable to lead to difficulties. In other words, when maintenance figures are compared the quality of maintenance should be taken into account.

The first factor, the interest on the construction cost,

is determined to a large extent by the type of construction and local conditions, so that it will be readily seen that the total figure which should be used is the sum of this and the other two items, and the engineer should so design his track as to keep the sum of these three items at a minimum under all conditions. Accounting for these three factors necessarily requires that track maintenance be compared on a unit length basis, and the cost per track mile, therefore, will probably be the best unit. The various other factors which affect the life of the track, such as vehicular wear on the pavement, density of car traffic, weight of car, speed and load concentrations, should be taken into consideration in the design of the track.

Let us take, for instance, the third factor, labor and materials necessary to keep the track in a usable condition, and follow this figure through for a period of years on a definite stretch of track. During the early life of this track comparatively little money is expended in its maintenance. As time passes, however, there will be an increased cost of maintenance each year, with the result that after a certain period this item of labor and materials would equal the interest on reconstruction. When this condition occurs, the track should be reconstructed. This, of course, assumes a rather ideal condition in which there is no interference from city authorities or others having some jurisdiction over the track in question.

If the annual amounts expended each year were plotted as ordinates and the years as abscissas there would result a curve which might be called the characteristic curve of maintenance. This curve, of course, would vary with the different track conditions, with the increase in traffic, design of track and other factors. A curve of this kind is illustrated in the accompanying diagram, which was taken from an actual example. It will be noted from this curve that variation in maintenance methods can be made which will materially alter the curve. For instance, during the fourteenth year of the life of the track in question, a little more money was spent than usual, with the result that during the fifteenth year there was a considerable decrease. This particular decrease was due to a change in the method of maintenance and illustrates the advantage of repairing track by the use of offset plates and a grinder. It will be noted from this curve too that the actual amount of money spent per mile during any particular year has little bearing on the average track mile unit cost of maintenance.

It would seem, therefore, that the only fair basis of comparison would be on the average cost of maintenance per year during the entire life of the track, or in order to compare various stretches of track which were not worn out it would be necessary to compare the accumulated maintenance to date, to which should be added information as to the type of construction, kind of traffic, etc. It would be almost impossible to lump the various factors represented by traffic conditions unless the number of revenue seats operated over this track during its entire life were used to make a comparison. The immense amount of clerical work necessary to accomplish this result would make it very difficult if not impractical. It might be well to add that the reason for selecting the revenue seat basis of comparison is that it takes into account the general efficiency of the operation of the road, and eliminates a large part of the variables.

Should it be advisable to compare the maintenance of track on the mile per year basis, it would probably be well to separate the paving maintenance from that which pertains directly to the track, as frequently types of pavement are required by city authorities which are not suitable for track construction. This

would also eliminate one of the variables, which is vehicular traffic on the street. In order further to compare track, it will be necessary to subdivide the types of construction, such as, open track on interurban and suburban lines, and sub-surface track in paved or unpaved streets.

It might be of interest here to call attention to an empirical formula which has been developed and used by this company and found to approximate closely the maintenance conditions in this city. This formula is as follows:

$$200 + (31^{1/2} \times \text{the average number of cars per hour (taking the entire year as a basis)}) = (\text{in dollars}) \text{ the average annual maintenance per mile of track in paved streets.}$$

The average annual maintenance in this case is the total accumulated maintenance divided by track life.

While this formula would undoubtedly not meet all of the conditions in the various cities, nor does it meet all of the conditions here, it has been found to give approximate results in a number of cases.

The foregoing analysis is given merely to indicate something of the study which must necessarily be given to a subject before any definite conclusions can be drawn regarding what would constitute a fair unit cost of maintenance for track. At the present day there is not a successful manufacturer who does not investigate his unit costs, and inasmuch as railroading is the manufacture and sale of transportation, it is certainly necessary to determine the various units which go to make up the costs of manufacturing transportation. I therefore, heartily commend your efforts along this line.

D. P. FALCONER,

Engineer Maintenance of Way.

NEW YORK STATE RAILWAYS

SYRACUSE, N. Y., Sept. 6, 1916.

To the Editors:

Your recent editorials on the subject of a "Unit for Comparing Track Maintenance Costs" are very interesting and cover the subject in most of its phases. The cost per track-mile seems to me to be the proper unit if all physical and operating conditions are taken into account. It would be necessary, of course, to classify it into open track, track in dirt streets and track in paved streets, and then take into account types of construction, amount and speed of traffic, and any other conditions which may affect the maintenance cost.

In a paved street it does not seem to be advisable to separate the pavement from the track, as generally the repair of one necessitates the repair of the other and the two should be considered as a complete structure. Pavement maintenance costs, however, should be kept as a matter of information. If track is placed in a paved street and cars are not operated over it, the maintenance on the pavement would be practically little more than the same pavement in a street without the car track, unless the vehicular traffic is very heavy.

In comparing track maintenance costs, the question of the degree of maintenance is an important consideration. In general, the maintenance is based on an arbitrary percentage of the receipts rather than on the fact that "a stitch in time saves nine," a basis which would be more satisfactory to maintenance engineers. The mechanical and electrical departments have entirely different problems to deal with. Cars are pulled in and overhauled at stated intervals and thus kept up to a certain standard, while, on account of the high cost of work in streets, a way engineer would not be permitted to excavate and examine joints and ties for defects at stated intervals. Track repairs are generally not made until they are absolutely necessary, with the possible

exception of grinding joints. On open track construction the problem is more simple. Track walkers keep joint bolts tight and spikes driven, and generally an inspection of ties is made twice a year. Incidentally, I believe the inspection method to be more efficient and economical than arbitrarily to renew so many ties a year, based on some average figures or assumptions.

In general, it is not as practical to standardize the maintenance of civil engineering structures as it is mechanical and electrical, on account of the mileage of territory covered, physical conditions and the construction and maintenance being subject to the whims of public authorities and the public in general.

E. P. ROUNDEY,
Engineer Maintenance of Way.

THE DENVER CITY TRAMWAY COMPANY
DENVER, COL., Sept. 8, 1916.

To the Editors:

I have always believed a unit to measure track maintenance efficiency was necessary. Although the many types of track construction and various classes of paving used seem to make this difficult, it must be remembered that many large manufacturing establishments have made time studies and compiled cost records of all sorts and kinds of work. Hence, it would seem that the problem confronting the way engineer should be capable of solution.

Possibly one reason that greater progress has not been made in the development of these scientific data is that there has been too much "cut and try" in track building and maintenance. We have developed track foremen largely from laborers, and they have had to get their education by hard knocks and experience. They have, as a rule, done wonderfully well, but how much better would they have done had their training been "planned" for them and had they, in most cases, been recruited from sources where brain and brawn were at a balance instead of brawn tipping the beam.

We have heard maintenance of way engineers severely criticised for their maintenance costs per mile of track, but after conditions were investigated the person criticised has been found to be doing very well, all things considered. Many times I have seen unit costs prepared on a mile of track basis that covered only certain items whereas those of other companies, supposed to cover the same work, included other items properly chargeable. I believe that cost figures for comparative purposes should be made up for each type of rail, joint, tie, ballast, paving base and paving wearing surface installed, that a sketch showing a cross-section of various combinations of these be included with the cost figures and that a statement covering the character of the charges put through to make up these costs. The cost and amount of materials used as well as the hours of labor and rates of pay should be very carefully shown. I cannot see any other way of arriving at figures that can be used to compare one property with another or one man's ability with that of another.

I can hear a great many engineers saying: "Lord! What a mass of detail such a scheme involves," and perhaps for that very reason it will not be worth doing. But if manufacturers, compelled by keen competition find it advantageous to know what they are doing, why should not the street railway company that is a victim of the "shrinking nickel"? I firmly believe this is a matter that should take up the time of a committee on costs and cost finding, and that it can be adjusted in no other manner.

I trust that this whole matter will be aired in your columns in a real constructive way.

EDWARD A. WEST, Chief Engineer.

Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

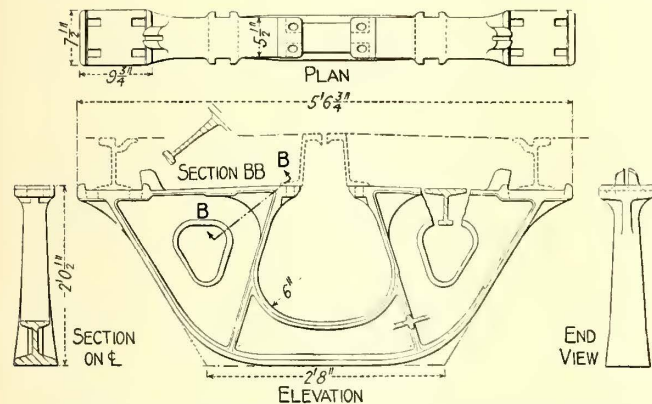
Experience with Removable Trolley Shoe—Headlight of Novel Type—
Grinding Joints for 40 Cents on the Boston Elevated—Improved Yoke
for Conduit Railway in Washington, D. C.—Electric Track Switches
in New England—Getting Lighting Arresters Ready for Season of 1917

Improved Yokes for Conduit Railway Old-Type Yokes Being Replaced by New to With- stand Modern Street Traffic

BY C. S. KIMBALL

Engineer Way and Structures Washington Railway & Electric
Company, Washington, D. C.

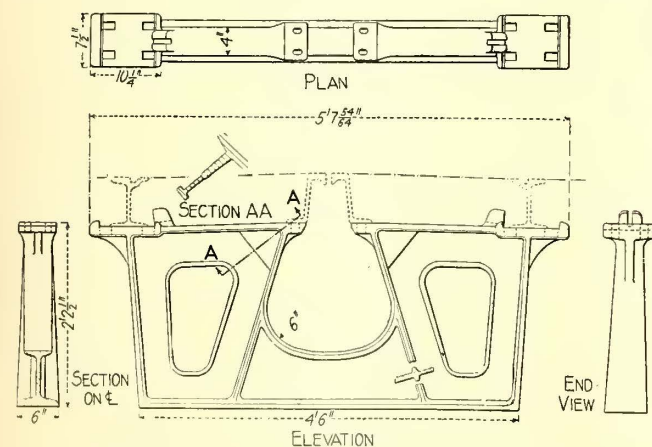
As there are so few conduit railways in the United States one hears very little of the problems of the engineers connected with these lines. It may be of interest, however, to the readers of the *ELECTRIC RAILWAY JOURNAL* to know that the yokes which are now being used in new track and on existing track wherever necessary to replace those broken in service, or whenever there is



CONDUIT YOKE FORMERLY STANDARD WITH WASHINGTON
RAILWAY & ELECTRIC COMPANY, WASHINGTON, D. C.

an opportunity to substitute a new yoke for an old one, are radically different in design from those which still support the larger part of the track in Washington, D. C.

The differences between the old and the new design are clearly shown in the accompanying drawings. Since the original track was installed, more than twenty years



NEW CONDUIT YOKE DESIGNED TO WITHSTAND MODERN HEAVY
STREET TRAFFIC

ago, there has been a very considerable increase in the weight of equipment which it is called upon to carry. While the old yokes have in general given excellent service, a number have failed in recent years due to breakage near the middle, their weakest part. In these yokes there is no direct support under the rail, whereas in the new type there is a broad, flat base 4 1/2 ft. wide which sets much more securely upon the foundation.

The new yokes weigh about 500 lb. as compared with 350 lb. in the old type, and they are of a good quality of gray cast iron. They are molded at present at the foundry of Davis & Thomas in Catassauqua, Pa.

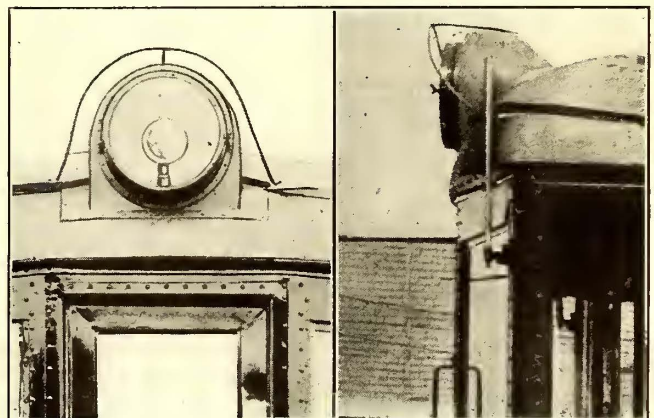
Headlights Recessed in Car Roof

New Design of Headlight Proves Satisfactory for
High-Speed Road

BY JAMES W. BROWN

Superintendent of Shops Wilkes-Barre & Hazleton Railway and
Lehigh Traction Company

Recessed headlights have been used on the new equipment of the Wilkes-Barre & Hazleton Railway and of the Lehigh Traction Company and have given complete satisfaction. Owing to the high speed at which these interurban cars are operated, it was desired to place the headlights in such a position that the light would project a considerable distance farther than the braking distance. It was also desired to place the headlight



HEADLIGHTS RECESSED IN ROOF OF CAR ON WILKES-BARRE &
HAZLETON RAILWAY

where it could not be reached easily or broken. The illustration herewith is of the GE Form J-28 headlight which has been installed on this equipment.

These headlights are recessed in a hood at each end of the roof and covered with a sheet steel housing. They are equipped with a dimmer, consisting of resistors wound on insulated porcelain tubes and enclosed in a steel frame placed underneath the car.

This stationary headlight has done away with a great deal of trouble and annoyance that was experienced with the old headlights in carrying them from one end of the car to the other. Now a trainman has only to

turn off the snap switch at one end of the car and to turn on the one at the other end. These new headlights have not given us any trouble up to the present time and all that it has been necessary to do so far was to clean the glass in the hood.

Installation and Maintenance of Car Lightning Arresters

The Author Describes Types of Arresters and Their Location on Top and Underneath Cars

BY R. H. PARSONS
Electrical Foreman

As winter approaches the question of lightning arresters should be a prominent one in the minds of railway superintendents, master mechanics and, last but of course not least, lightning arrester manufacturers.

In the first place all arresters should be put in good condition before the summer storms commence. Winter is the proper time for lightning arrester inspections, tests and renewals. During the course of such inspections it will be found that many arresters are so badly damaged as a result of the storms of the previous summer as to necessitate complete replacement. In making such replacements the type of arrester best adapted to local conditions should be chosen for it must be borne in mind that the best is none too good.

There are nearly as many types of lightning arresters as there are types of cars and of course each master mechanic has his favored or disfavored type and

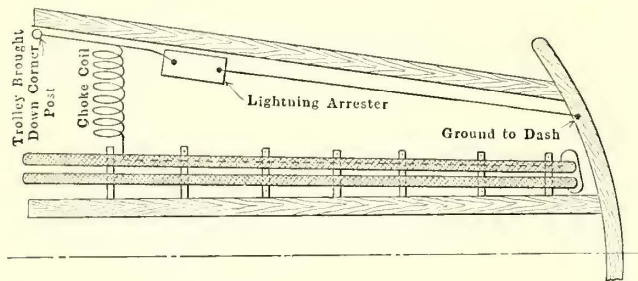


FIG. 1—ARRESTER UNDERNEATH THE CAR—WIRING LAY-OUT FOR OLD CARS

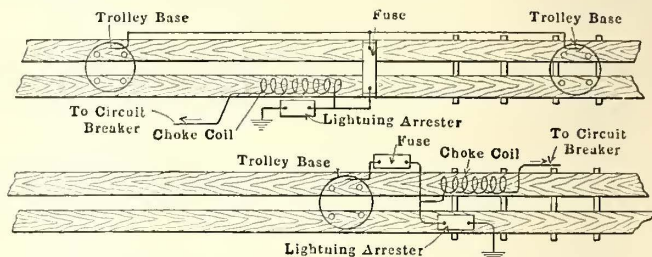
each manufacturer is sure his arrester is best. It seems worth while, therefore, to point out a few of the practical considerations other than those pertaining to operation which should be taken into account in the selection of new arresters.

To facilitate mounting, an arrester should be rugged and compact. It is desirable that it be adapted to mounting in any position or location, and that the labor of mounting be a minimum. Also the arrester should require very little care and attention and to facilitate inspection should be so designed that it can readily be tested in service. Of course the first cost should be reasonable. Naturally, an arrester that will fulfill all requirements is hard to find.

The function of the lightning arrester is the protection of electrical equipment from damage by lightning. The desired result is ordinarily obtained by providing a by-path, consisting of one or more spark gaps in series with a resistance, connected between trolley and ground. The gaps do not permit discharges to take place at the ordinary line voltages but offer little resistance to the high voltage lightning disturbances. The line voltage, however, tends to maintain the arc across the spark gaps after it has once been started by the high voltage discharge and it is in the means of preventing or de-

stroying this arc that manufacturers differ so widely in their methods of construction.

The trouble with the earlier types—and with some of the later types for that matter—was that the voltage at which the arrester would start to discharge was higher than the breakdown voltage of the armature and field insulation, with the result that motor windings were usually damaged before the arrester got into action.



FIGS. 2 AND 3—ARRESTER ON TOP OF THE CAR—WIRING LAY-OUTS FOR TWO TROLLEY AND ONE TROLLEY BASE EQUIPMENTS

It will be borne in mind that the insulations of a few years ago were not barriers against voltages of 3000 or 4000, and that the lightning arresters of that time were not designed to carry off static at voltages lower than these. It might be mentioned here also that the proper point to set a lightning arrester at the present time is only a little above the line voltage, the common practice among street railways that give proper attention to their arresters being in the neighborhood of 1000 volts.

Among the newer arresters on the market, the aluminum cell or electrolytic type is accepted as the most efficient of all devices for protection against lightning. The electrolytic arresters built by the different companies differ in construction but operate on the same principle. This type of arrester depends for its operation on the peculiar properties of a film deposited electrolytically on aluminum trays. This film prevents the flow of current at normal voltages, but offers a free path for currents at high voltages or for static discharges. Upon cessation of the abnormal stress the film regains its original resistance instantly. This arrester is conceded to be the best on the market for protection when it is in perfect condition. It is especially well adapted

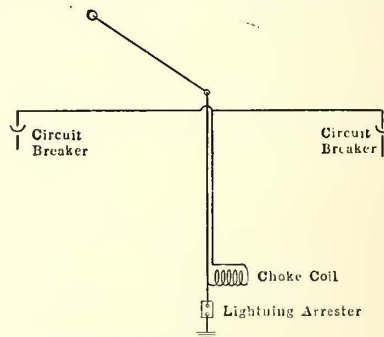


FIG. 4—FAULTY ARRANGEMENT OF CAR WIRING

for station use, where it can receive the attention ordinarily given storage batteries. It has been recommended by one manufacturing company for pole and car use, but for both these uses the following objections are found: The arrester must be removed and stored during the winter; it takes up more space on a car than can ordinarily be spared; it is practically impossible to place the arrester on the roof of a car; if placed underneath the car body it is subjected to dust and wheel wash; the class of men ordinarily found in carhouses are neither skillful enough nor careful enough to give it the

attention it would require for car service. If this arrester were kept in proper condition there is no question as to its usefulness, but if neglected, it would be far inferior to other types. It is also a question if it would survive the bumping and bouncing over rough tracks. The high cost is a further deterrent to its adoption for car work.

Although much depends upon the type and adjustment of the lightning arrester used, more depends on its condition, location and general relation to the car wiring. A lightning arrester would be useless without a choke or kicking coil, which in turn would be equally as useless if not properly placed.

It is the opinion of those who have given the question much study, that the proper place for both choke coil and lightning arrester is on the roof of the car, and as near the trolley base as possible. One reason for this is the simplicity and efficiency of the wiring. There is no doubling back of the trolley lead, and the path for the lightning discharge is direct. The arrester on the roof is, of course, subjected to the full force of the rain, but clean, pure water is not harmful, especially as the delicate parts of the arrester can be easily protected. The rain runs off quickly, and when the sun shines again the arrester is soon dry. On the contrary, when placed underneath the car it is subjected to water, mud and dust, and is not in a position where it will dry if it becomes wet.

When located in the car it has the advantage of accessibility (perhaps) and protection from the elements, but the time a lightning arrester is particularly useful is during a thunder storm, and a lightning arrester working is apt to make some noise. Not infrequently during a heavy discharge a lightning arrester is blown up, commonly speaking, and it would be at just the time when passengers are nerved up on account of the storm that this would occur. The considerations of safety and comfort to passengers, therefore, oppose the placing of the arrester inside the car. Often the lack of head room prevents the location of the lightning arrester on the roof. In such cases it should be placed underneath the car.

A sketch, Fig. 1, is here shown of the wiring of the lightning arrester and choke coil on old type cars wired with canvas covered cables. The ground wire can be run to the dash, which is connected mechanically to the bumper, side sill, bolster or side bearings, and thence through the trucks to ground. Satisfactory wiring layouts for the lightning arrester circuit where the arrester is located on top of the car are illustrated in Figs. 2 and 3.

A few rules to be observed in the installation and care of lightning arresters are:

The wires in the lightning arrester circuit should be as straight and free from bends and sharp turns as possible, and should be securely connected to the nearest ground. If there must be kinks in the wiring make them in the trolley circuit.

When the lightning arrester is located underneath the car the trolley lead where it is run down the corner post or other similar place should not be placed near the wiring of other circuits.

Kicking coils should be made on spools at least 5 in. in diameter, and should have at least ten turns—a larger number is better. The old-time choke coils 2 in. in diameter were a mistake.

The wire used in the lightning arrester circuit should be No. 6 B & S or larger.

The connection of the fields to the trolley end and the armature to the ground end of the motor circuit will be found effective in saving armatures from damage by lightning.

Cutting in the lights during a storm will give a greater number of easy paths for lightning discharges, and at the expense of a light socket or lamp will often save the motor equipment.

Avoid carefully all conditions similar to that in Fig. 4. This sketch illustrates one of the disadvantages of placing the arrester underneath the car.

Electric Track Switch Practice

Features of Installation and Maintenance on Two New England Railways

The Boston Elevated Railway has about 300 Cheatham electric track switches on its system. There are also eight Collins electric switches which have been installed comparatively recently.

During the past three years thirty-one new automatic switches have been installed, and additions are being made from time to time as the volume of traffic at junction points warrants the expense. The other factor which determines the advisability of installing a switch



MOTOR-OPERATED TRACK SWITCHES AT THE BUSIEST CORNER IN NEW ENGLAND

of the automatic type is the amount by which the movement of traffic would be facilitated. On the Elevated Railway trunk lines the use of electric switches is becoming standard practice, as the cost of operating hand switches, together with the delay to traffic, makes the use of them uneconomical, the total extra costs easily exceeding the maintenance costs for electrically-operated units.

The question whether an electric switch shall be installed to supersede a hand-operated switch is finally decided by the division superintendent. He makes the recommendation, which is passed upon by the superintendent of transportation or the superintendent of traffic, or both in conjunction. The question of these switches is finally decided by the superintendent of wires.

Maintenance is divided between the maintenance of way department and the wire department. The former renews the links and lugs only; the latter cares for the electrical connections to the links, including the plungers.

The Collins switches of the U. S. Electric Signal Company, as recently installed, are equipped with small motors, which give a slow motion to the switch and prevent splashing in wet weather. These are installed at locations where there are many pedestrians crossing. Two are on Washington Street at the intersection with Summer, the "busiest corner in New England." In this equipment the switch cannot be thrown between the trucks of a car by a following movement under the

contactor; the street box is automatically sealed and is not dependent on the proper making up of pipe joints or gaskets; a positive anti-straddling device is provided; only 110 volts is sent into the street box; the entire mechanism can be lifted out of the street box without making any disconnections; the contactors are small and are mounted on standard ears; and standing under the contactor for an indefinite period has no damaging effect on any part of the mechanism.

Cheatham switches are located at many points throughout the system. Some are placed in the loops at carhouses, where a large number of prepayment cars with trailers are handled. Three are at Arlington Heights loop (where a prepayment area is to be established), and three at the Watertown carhouse. It is probable that electric switches will be installed at storage turnouts in all loop tracks, as they facilitate the



SOLENOID-OPERATED TRACK SWITCHES AT COPLEY SQUARE, BOSTON, MASS.

handling of cars running on five-minute headway or less.

Maintenance costs of Cheatham switches for eleven months ending June 1, 1916, are as follows:

On surface lines, outside subways, 278 switches, total for labor and materials.....	\$2,775.78
In subways north, ten switches, total for labor and materials	37.22
In subways south, three switches, total for labor and materials	13.39
In Boylston Street subway, one switch, total labor and materials	12.69
Total for 292 switches.....	\$2,839.08
Average	9.72

The Bay State Street Railway, Boston, Mass., has twenty American automatic switches, four Collins automatic switches, both the product of the United States Electric Signal Company, seventeen Cheatham and three Squires electric track switches. These switches are at important junction points, in the following cities and towns, where main lines converge: Boston, Chelsea, Revere, Haverhill, Lawrence, Lynn, Salem, Saugus, Everett, Malden, Lowell, Fall River, Quincy and Weymouth. All the Cheatham switches are of the quick-moving type.

The location of an electric switch is determined by the general superintendent, often on the recommendation of the division superintendent. It is probable that several new units will be installed this year on the Bay State system, though none have been ordered as yet.

In the dispatcher's telephone equipment of the interurban division of the Iowa Railway & Light Company at Cedar Rapids, Iowa, phonograph horns are attached to the transmitter and to the receiver. It is thus possible for the dispatcher to sit at his desk and use the telephone without being hindered by ear pieces and cords.

Trolley Shoe Practice

Results of Experience with New Overhead Contact Device Are Given

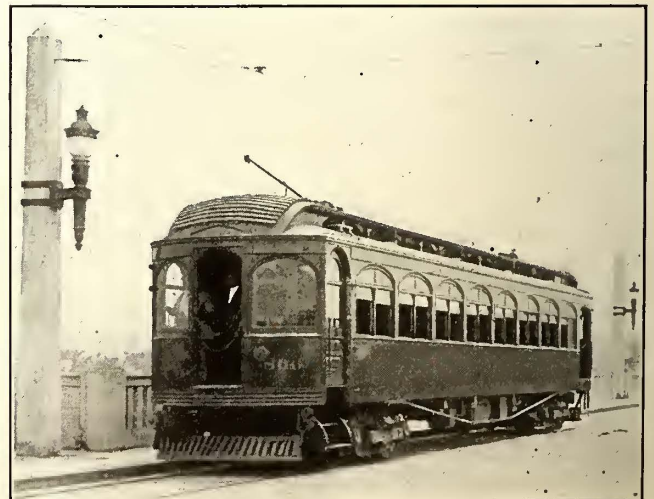
Less than six months ago the development of the Miller trolley shoe made the principle of the sliding contact for the collection of current applicable to cars using the ordinary trolley poles. The April 29 issue of the *ELECTRIC RAILWAY JOURNAL* described this shoe, which is manufactured by the Miller Trolley Shoe Company of Boston, Mass., and announced that it had just been placed on the market. The shoe is now in use on more than sixty electric roads. Among the lines on which it has become standard are the Portland & Lewiston Interurban Railway, the Central Maine Power Company, the Lehigh Valley Transit Company (interurban service), the & Jacksonville Railway, (interurban and locomotive service), the Alton & Jacksonville Railway, Chicago & West Towns Railway, Tri-City Railway and the Chicago, Harvard and Geneva Lake Railway.



VIEW OF TROLLEY SHOE

The advocates of the Miller shoe state that it clings to the wire giving excellent contact and practically eliminating the noise, vibration and arcing that are common with the ordinary trolley wheel, and it is said that with much less tension on the trolley pole, it has been possible to increase the speed around curves where trouble was formerly experienced with poles leaving the wire.

Many of the roads which have adopted the trolley shoes first put them on the cars which were operated in high-speed service, the Lehigh Valley Transit Company being a typical example. Harry Branson, superintendent of equipment of this road, has installed them on the cars operating on the limited service between Allentown and Philadelphia, Pa. On this service it has been reported that the trolley shoes have averaged more



CAR EQUIPPED WITH TROLLEY SHOES IN LIMITED SERVICE BETWEEN PHILADELPHIA AND ALLENTOWN, PA.

than 10,000 miles of service before having to be replaced.

Railway men who are unfamiliar with this shoe raise the question of the wear of the trolley wire when the sliding contact is mentioned. Micrometer measurements made by the railway above cited, however, indicate no additional wear on the wire.

Prepared Blocks and Wedges Speed Up Track Leveling

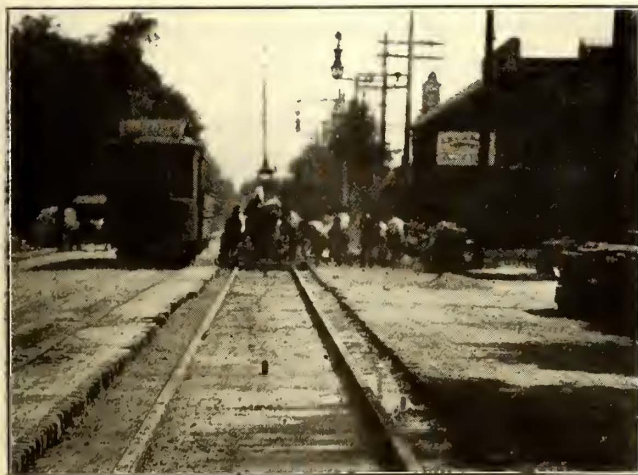
The accompanying illustrations show the reconstruction of tracks on the lines of the Northern Ohio Traction Company in Akron, Ohio. In this construction work the rails were laid on International twin steel ties embedded in concrete, which forms the foundation for the paving brick. In order to facilitate the work of



WORKMEN LEVELING TRACK IN AKRON, OHIO

leveling the track, the company used special blocks and wedges made by The Steele-Alderfer Company, Cuyahoga Falls, Ohio. The blocks measure 6 in. x 8 in. x 8 in. and the wedges 2 in. x 4 in. x 8 in., tapered on one size, hardwood being used for both.

Track levelers often use for this purpose rough blocks and wedges chopped out of any available material. If the material is knotty or crooked-grained, considerable time is required to make wedges that will serve the purpose. Thus the men have to stop at short intervals to cut out a new supply of wedges. This waste of time is eliminated by the use of the prepared blocks and



TRACK WORK COMPLETED AND READY FOR PAVING BLOCKS

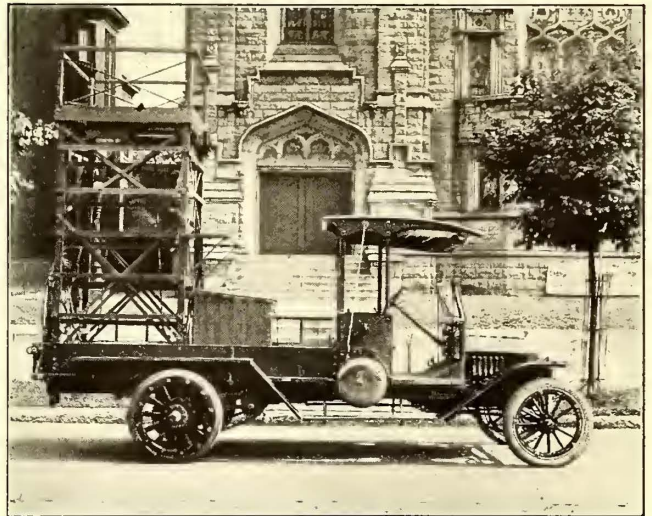
wedges. The blocks are laid underneath the rail and the wedges are inserted on either side. Two men then drive in the wedges until the rail is level.

New Louisville Line Truck

Railway Finds One-Ton Truck Is Rugged and Speedy and Efficient in Hilly Country

An automobile line truck has recently replaced an old-style wagon and eight mules in Louisville, Ky. It is used by the Louisville Railway motive power department, of which Frank H. Miller is superintendent. The outfit consists of a line tower mounted upon a truck which is manufactured by the Smith Form-a-Truck Company of Chicago, Ill. This truck uses the Ford automobile chassis as a power plant, and slips over the frame, reinforcing it throughout the entire length. The Ford rear axle is used as a jackshaft, on which are mounted two sprockets for the double chain drive to the rear wheels. Solid tires having a 3 1/2-in. tread are used on the rear wheels and the front wheels have pneumatic tires on demountable rims.

As shown in the accompanying illustration, the tower itself is built on the rear of the truck. It is made in two parts, the upper section of which is capable of being raised and lowered to suit the work which is being done. The maximum height above the ground is

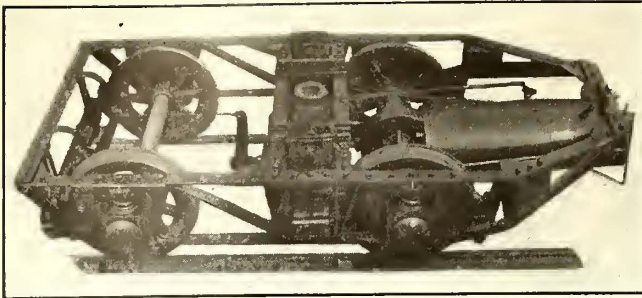


LIGHT AND SPEEDY LINE CAR USED BY LOUISVILLE (KY.) RAILWAY

15 ft. 8 in. and the minimum 10 ft. An 8-ft. ladder is carried for extra high work or for going down into manholes. Mounted on the side of the car is an 18-in. single stroke warning gong, which is operated by a rope which hangs over the driver's seat.

Some years ago the Louisville Railway undertook to use automobile line trucks, but for their service the types available were unsatisfactory, and they were given up. The truck described above, however, has given excellent satisfaction. It is ready for service at any time and for emergency repair work it has been found especially efficient. The weight of the truck is 4600 lb. complete, including two men, material, tools, etc. It will carry an overload of about 50 per cent of its rated 1-ton capacity.

The Urbana & Champaign Railway, Gas & Electric Company, Champaign, Ill., has placed a large American flag in electric lights over the three-story station and general office building in Champaign which it occupies jointly with the Illinois Traction System.



MOTOR TRUCK OF STEAM MOTOR CAR SHOWING MOUNTING OF ENGINE

Steam Motor Car Used by Vermont Railroad

All-Steel Passenger Car with Smoking and Baggage Compartments Is of Excellent Design

The White River Railroad of Vermont is operating between Bethel and Rochester a steam motor car, the construction of which represents a distinct advance in the development of railway motor cars. The route between Bethel and Rochester, about 20 miles in length, passes through the White River Valley, which is one of the many beautiful sections of New England. Rochester itself while not a large city is a progressive trading center for a considerable population living in the surrounding towns. The new car is an important addition to the railway service of this locality. It is the product of the Unit Railway Car Company of Newton, Mass., which is affiliated with the Stanley Motor Carriage Company of Newton, manufacturers of steam automobiles.

The car body was constructed by the Laconia Car Company in Laconia, N. H. It is about 50 ft. long, and seats forty-four passengers. The front end of the car has a baggage compartment, a smoking compartment, and the motorman's cab. The car has plush seats, electric lights and the standard equipment required by the Interstate Commerce Commission. The accompanying illustrations show the general appearance of the car, the seating arrangements and the motor truck.

One of the unique features of the car is its power plant. The steam is generated in a vertical fire-tube boiler, comprising about 600 tubes, each $\frac{3}{4}$ in. in di-

ameter. The working steam pressure is 500 lb. per square inch. Kerosene is the fuel used, the flow being controlled automatically by the boiler pressure.

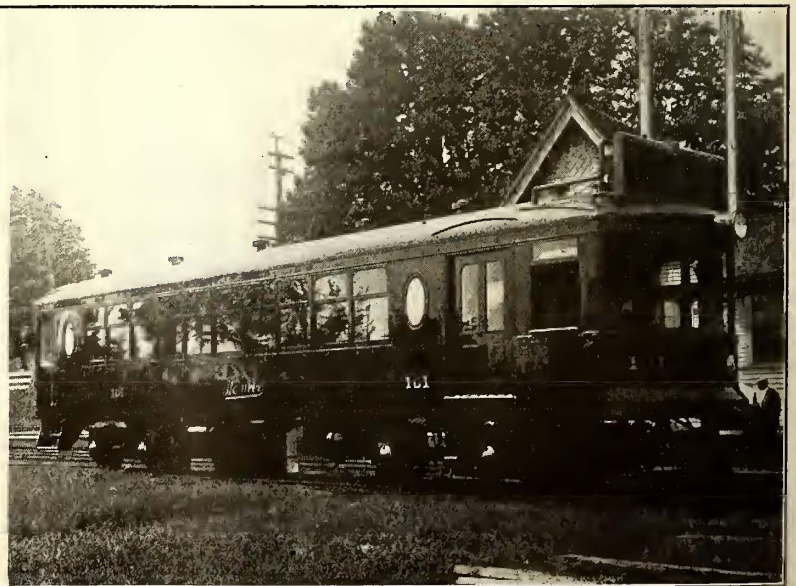
The engine is a single unit connected directly to the driving axle by spur gears. It is of the two-cylinder, double-acting, simple type which has been developed for automobile use by the Stanley Company. The rating is 60 hp., by which is meant the power which can be delivered continuously to the rims of the driving wheels. The reserve power is such that 200 hp. can be developed for starting, acceleration or climbing hills. The car is capable of a sustained speed of 45 m.p.h.

From the engine the steam passes to the condenser, which is of the automobile radiator type. There is only a small loss of steam, so that the 150 gal. of water carried is sufficient for 1000 miles. In ordinary service the car runs about 5 miles per gallon of kerosene.

It is believed that this type of car has a field in developing traffic on branch lines and lines where the present patronage does not warrant electrification. It has also been offered as a possible solution of the "owl car" problem.

New Interlocking Machine for Pacific Electric Railway

The Pacific Electric Railway is installing an electro-pneumatic interlocking machine in its terminal at Sixth and Main Streets, Los Angeles, Cal. The machine will have a twenty-three-lever frame, consisting of eight signal levers, ten switch levers with standard detector circuit equipment and five spare levers. This machine will be provided with sectional route locking, and an illuminated track diagram will be mounted directly above the levers. Two element 50-cycle vane relays will be used in connection with the detector circuits. A total of nine two-position and eleven three-position light signals will be used in this installation. In the train shed the light signals will be suspended from the elevated structure. A special feature in the design of these signals is the use of lenses in the side of the light housings whereby the motorman is able to observe the indication even though he be directly opposite the signal. The background of these signals is shaped so as to prevent all direct light from shining through the side lenses and giving a false indication. The contract for the material for this installation has been awarded to the Union Switch & Signal Company.



INTERIOR VIEW OF STEAM MOTOR CAR SHOWING SEATING ARRANGEMENTS; EXTERIOR VIEW

NEWS OF ELECTRIC RAILWAYS

MR. WHITRIDGE DEMURS

Files with the Governor a Letter Taking Exception to the Public Service Commission Holding Him to Accountability for Strike

Frederick W. Whitridge, president of the Third Avenue Railway, New York, N. Y., has made public a letter which he wrote on Sept. 1 to Governor Whitman of New York dealing with the letter addressed previously to the Governor by Chairman Straus of the Public Service Commission, in which the chairman gave an account of the activities of the commission in connection with the first of the recent strikes in New York. The commission in its original finding placed the blame for the strike on Mr. Whitridge. Mr. Whitridge was then abroad. He now takes exception to the conclusions of the commission. His letter to the Governor contained copies of his correspondence with Mr. Stevens, then chairman of the Second District Commission, in which he took exception to the last seven lines of the public statement of Mr. Stevens to the newspapers with respect to the conditions of the strike settlement of 1913 in Yonkers. He then characterized these lines as erroneous and as containing a further expansion of what he said, to which he did not assent. His letter of Sept. 1, without this correspondence, follows:

"I was yesterday, Aug. 31, shown a copy of letter addressed to you by Oscar S. Straus, dated Aug. 10, giving an account of the activities of the Public Service Commission during the previous month and saying that that commission had learned important lessons which they hoped to utilize for imposing further legislation.

"This letter is largely taken up with a discussion about me and what I have done and left undone. The commission has not hesitated to say that:

"There can be no question that the strike on the Yonkers and Westchester lines and the events which followed in the train of this strike, including the strike on the other branches of the Third Avenue Railway and the threatened difficulties with the lines of other companies throughout the city, came about as the immediate and logical result of the attitude of Frederick W. Whitridge, president of the Third Avenue Railway, and the actions he took in the matter proved conclusively that he either intentionally violated the agreement he had made with the men to arbitrate and which he was in honor bound to keep, or that he was so negligent in his duties to his stockholders, his employees and the public, as to forget entirely this important agreement."

"The notion that I had the power to loose or bind the forces of destruction and disorder, which have broken out in this country within the last few weeks, even though I had been here, instead of 4000 miles away, is sufficiently absurd on the face of it, but in consequence of the declaration I have quoted, some of the newspapers and some of the public have got it into their heads that I have deliberately violated a contract or agreement to arbitrate all the differences with my employees. That is an odious charge. I resent it and it is not true. I say to you that I have never made any such agreement, that no such agreement now is or ever was in existence, and nobody, so far as I know, ever pretended that any such agreement did in fact exist down to the time of this declaration of the Public Service Commission. In the absence of any formal agreement, which the commission did not dare even in my absence to allege, they produced a stenographer's report of a conference which I had with F. W. Stevens, chairman of the Public Service Commission of the Second District, in 1913, and undertook to spell a contract out of that report which had laid under the dust for nearly four years without having been heard from. The conference was held for the purpose of inducing the Yonkers men, who had been on strike, to return to work, and for no other purpose. That object was accomplished largely through the tact of Mr.

Stevens, and to assist him I agreed to arbitrate certain things under certain conditions, if it became necessary. It did not become necessary because the men had no grievances which they wished to arbitrate. What I said about arbitration at that time related to the settlement of the Yonkers strike in 1913, which we were then discussing, and did not relate to anything else or to anything which had occurred or which might occur in 1914, 1915, or 1916, and nobody ever pretended it did.

"After the conference was over, copies of this stenographer's report were sent to the men. It was not sent to me. I did not initial it and to this day I have never seen it, but a day or two after the meeting, I saw a newspaper report, in consequence of which I telegraphed exceptions to Mr. Stevens.

"The endeavor to spell a permanent agreement for arbitration out of the stenographer's minutes upon this state of facts, I do not care to characterize, although the commission's remark that 'we have already developed the fact' throws some light upon their mental processes. Still less do I wish to enlarge upon the manner in which the stenographer's minutes were used at recent hearings.

"I understand from Mr. Cook, our counsel, that his complaint of the procedure of the commission was made to it directly, and Mr. Maher, whose testimony was not completed, informs me that his position has not been correctly or fairly represented."

WAGES UNDER INDIVIDUAL CONTRACTS IN NEW YORK

The schedule of wages of trainmen of the New York (N. Y.) Railways contained in the individual working contracts referred to in the *ELECTRIC RAILWAY JOURNAL* for Sept. 9 are based on a ten-hour day. The rates for conductors on the electric lines are as follows: First year, \$2.60 a day; second, third and fourth years, \$2.90 a day; fifth and sixth years, \$3.10 a day; seventh, eighth, ninth and tenth years, \$3.20 a day; eleventh, twelfth, thirteenth, fourteenth and fifteenth years, \$3.30 a day; sixteenth year and thereafter, \$3.40 a day. The rates for motormen on the electric lines are as follows: First year, \$2.60 a day; second, third and fourth years, \$2.90 a day; fifth and sixth years, \$3.10 a day; seventh, eighth, ninth and tenth years, \$3.20 a day; eleventh, twelfth, thirteenth, fourteenth and fifteenth years, \$3.30 a day; sixteenth year and thereafter, \$3.40 a day. The rates for conductors on the storage battery lines are as follows: First year, \$2.60 a day; second year, \$2.70; third year and thereafter, \$2.80. The rates for motormen on storage battery lines are the same as those for conductors on these lines. The rates for conductors on the horse car lines are \$2.50 a day for the first year and thereafter. The rates for drivers on these lines is \$2.50 a day for the first year and thereafter.

Clockmen are to receive \$2.50 a day for the first year and \$2.60 the second year and thereafter. Terminal men are to receive \$2.50, \$2.80 and \$2.95. General inspectors are to receive \$3.75. Truck inspectors are to receive \$3.50, and line inspectors are to receive \$3.50 a day and \$3.60 a day. Starters are to receive \$2.90 a day, \$3.00 a day, \$3.20 a day and \$3.60 a day. Switchmen and flagmen are to receive \$1.95 a day, \$2.00 a day, \$2.20 a day, \$2.30 a day and \$2.50 a day. Road and school instructors are to receive \$3.15 a day, \$3.65 a day and \$3.90 a day. Register inspectors are to receive \$2.50 a day. Janitors are to receive \$2.00 a day. On storage battery and horse car lines inspectors are to receive \$3.10 a day, starters are to receive \$2.70 a day, \$3.00 a day and \$3.10 a day. Switchmen and flagmen on these lines are to receive \$1.95 a day. Janitors on these lines are to receive \$2.00 a day. Truck and car drivers attached to these lines are to receive \$1.95 a day, \$2.05 a day, \$2.20 a day and \$2.30 a day.

BANGOR STRIKE DECLARED OFF

The motormen and conductors of the Bangor Railway & Electric Company, Bangor, Me., who went on strike on Aug. 26, voted late on Sept. 9 to declare the strike off. The company had made no promises or concessions, and the strike was a complete failure on the part of the Amalgamated Association of Street & Electric Railway Employees of America. The company has reinstated about twenty men who went out on strike. These men conducted themselves properly during the period of the strike. They were re-engaged as new men, however, and have started in again with the company at the foot of the list.

As previously stated in the *ELECTRIC RAILWAY JOURNAL*, the service of the company had been practically normal for some time past despite unusual demands made upon the company for transportation. On the night of Sept. 8 Charles E. Hughes, the Republican nominee for President, spoke in the Auditorium, located about a mile from the Public Square in Bangor. Besides the other regular service the company that day maintained a two-minute schedule from the center of Bangor to the Auditorium. The cars on this run in particular were crowded to capacity.

Public sentiment on the side of the company increased steadily. At first the police were inclined to be somewhat lax in affording proper protection to the company, but any cause for complaint on this score that did exist was removed by the later activity of those charged with the work of enforcing the laws.

A feature of the strike was that despite the many new employees and with cars operating on almost normal schedule there was only one accident. This occurred on a car operated by an old employee and was not due to carelessness or negligence on the part of the company. In fact, in the history of the company there were never so few accidents. This is considered especially remarkable because of the numerous obstacles which the company was obliged to overcome. Out of 130 employees who worked as motormen and conductors and carhouse employees, only twelve remained loyal to the company at the declaration of the strike. The company had to build a new organization practically as large as the one which it had at the inception of the strike. Despite these obstacles, the company was able to break the strike and is now being complimented upon the attention, courtesy and fine appearance of the men who compose the new personnel. The new men are all residents of Bangor or Penobscot county and have thoroughly at heart the best interests of the community, of which most of them have been a part for many years.

REPRISAL ADVOCATED IN BUFFALO TAX CASE

In an effort to force the International Railway, Buffalo, N. Y., to drop its action for a review of its special franchise assessment made by the State Tax Commission, William S. Rann, corporation counsel of Buffalo, has recommended to the City Council that he be authorized to start a proceeding before the Public Service Commission for a reduction of fares charged by the railway on its city lines from 5 cents to 4 cents. The recommendation will be considered by the five members of the Council at its next meeting.

The special franchise assessment made by the State Tax Commission valued the company's properties and rights at \$12,557,500. This was reduced to \$8,573,850, and upon this the city levied a tax which became a lien on July 1, 1916. The company has instituted legal proceedings to have this assessment reviewed in the courts and is now seeking to have the matter sent to a referee for trial.

It will be necessary in the defense to have the company's properties appraised. The cost of the appraisal will be \$50,000, of which \$20,000 is now available. In view of the fact that the appraisal must be made, the corporation counsel says this same evidence could be used in the proceeding to have the rate of fare reduced. Their recommendation to the Council also points to the last financial statement of the company on file with the Public Service Commission which shows increased net earnings. In conclusion Corporation Counsel Rann says: "There is, I think, good reason to believe that the company could earn a net return of more than 6 per cent upon the present valuation of its property at the rate of fare of 4 cents."

SHORT STRIKE IN QUEBEC

A number of the employees of the Quebec Railway, Light & Power Company, Quebec, Que., who had organized themselves into a union, went on strike on Aug. 30 for the purpose of obtaining an increase in wages and recognition of their union by the company. The strike was confined to the lower section of the city. The upper town and Sillery sections of the system were not affected, that part of the system being operated by non-union employees. According to H. G. Matthews, general manager of the company, the men in the company's employ were under agreement to abide by the present scale of wages until Dec. 1, 1916. The company therefore took out ten warrants for breach of contract against the moving spirits in the strike and announced that the warrants would be executed unless the men returned to work by noon. A temporary settlement was effected through the intervention of Aldermen C. J. Lockwell and E. Therriault and Louis Letourneau, who prevailed upon the company to withhold the warrants. Subsequently these parties, together with Hector Laferte, counsel for the strikers, obtained a letter from the company agreeing to have the matters in dispute submitted to arbitration under the provisions of the Lemieux Act. The men returned to work at once and by evening all cars were again running on schedule. On Sept. 6 the company chose J. L. Perron as its representative on the board or arbitration, while the employees named Hector Laferte. The two arbitrators will follow the usual custom of selecting a third arbitrator.

BIDS FOR CONSTRUCTION MATERIAL RECEIVED

The Public Service Commission for the First District of New York during the week ended Sept. 9 received bids for the installation of tracks on the Seventh Avenue branch of the Lexington Avenue Rapid Transit Railroad. This is the line which connects with the first subway near Forty-third Street and Seventh Avenue, and forms what will ultimately be, together with the upper west side portion of the first subway, the new west side through line under the dual system. The low bidder on the contract was the firm of Engel & Hevenor, New York City, the unofficial total of whose bid was \$229,440. The contract provides for the laying of tracks from a connection with the first subway in Times Square under Seventh Avenue and other thoroughfares to a connection with the first subway again in Battery Park and also in the Brooklyn extension of the Seventh Avenue line. Practically all the materials, including ties and rails, employed in the work will be furnished to the contractor by the city. These have been purchased by the Public Service Commission for the city under separate contracts. The contract for the construction of the line was formally awarded to Engel & Hevenor by the commission on Sept. 14.

Bids have been opened by the commission for the supply of special work, including frogs and switches and necessary appurtenances to be used in the construction of the Southern Boulevard and Westchester Avenue branch of the Lexington Avenue subway. All of the work is to be delivered within four months. The Ramapo Iron Works, New York City, was the low bidder at \$11,427.

The commission on Sept. 28 will receive bids for the construction of a railroad yard in connection with the White Plains Road extension of the first subway. The yard will be located one block east of White Plains Road and will cover an area of several city blocks. Entrance to the subway yard will be from the north, and to the elevated yard from the south. The whole space to be occupied by both yards is about 800 ft. x 1100 ft. There will be storage room for nearly 600 cars in the subway yard, and for about 300 cars in the elevated yard.

The commission has granted an application of the New York Municipal Railway Corporation for an extension of time of two years to July 27, 1918, to complete the construction and begin the operation of the additional tracks on Fulton Street, Brooklyn, and an extension of two years to Feb. 2, 1918, to complete the construction and begin the operation of additional tracks on the Broadway line in the same borough. One cause for the extension of time has been the decision to rebuild the elevated structure at East New York, the contract for which was approved last

January and will require approximately two years to complete. Discussion over the disposition of the tracks on Fulton Street, west of Cumberland Street, is also an important factor in the grant of the extension of time in respect of that line.

INJUNCTION SOUGHT TO PREVENT COERCION IN ATLANTA STRIKE

On Sept. 7 Judge John T. Pendleton at Atlanta, Ga., signed a temporary restraining order directed against the officers and some thirty or forty individual members of the union linemen of the Georgia Railway & Power Company, who are on strike, and directed them to appear in court on Sept. 16 and show cause why a permanent injunction should not be issued. In its petition the company asks for a permanent restraint of the defendants from attempting to coerce men willing to enter the employ of the company; from molesting them personally, or harassing them; from picketing the company's premises, or loitering near those premises; from violence, threats of violence, insults, indecent talk, abusive epithets, and other attempts at coercion of men already in the company's employ, with intent to make them break their contracts with the company, or of men willing to take jobs, to keep them from taking those jobs.

The company alleges that the majority of the men employed in the line department who were members of the union and went on strike, did not want to strike, and were contented with their work, and quit their jobs only on order of their union officers.

The history of the strike is set out in the petition, which shows that on Aug. 5 the company discharged, "in the proper conduct of its business, for good and sufficient reasons," J. L. Carver, E. P. Smith and another man named Castleberry; that on Aug. 11 it received a demand from the local union, presented by Purcell, Pollard, Carver and others, that the men discharged be reinstated, this demand being accompanied by the threat of strike; that on Aug. 12, "against the desire of the majority," sixty-five men in the line department quit in a body. Altogether, according to P. S. Arkwright, president of the company, less than 100 men have quit the employ of the company since the strike began. The places of the strikers have been filled. The company is unwilling to take the strikers back in a body.

INCREASE IN WAGES FOR LOUISVILLE MEN

Two weeks after a delegation of motormen and conductors employed by the Louisville (Ky.) Railway and the Louisville & Interurban Company waited on President T. J. Minary, favorable action on their request for an advance in wages was taken by the board of directors. This advance, 1 cent an hour all around, is given in the expectation that the trainmen will continue to co-operate with the company in the safety-first work, and to meet the advance, estimated to total \$40,000 annually, that amount has been set aside out of the accident fund. The scale heretofore has ranged from 21 cents to 24 cents on all city lines, although on the country lines the 25-cent men are advanced to 26 cents an hour. The employees affected number about 1000 men. In announcing the advance in wages Samuel Riddle, superintendent of transportation, issued a statement to the men, reading in part as follows:

"Our board of directors, on carefully considering an increase of wages, has been confronted with a large falling off in receipts during the past three years and finds that an increase can be made possible only by an increase of receipts and a further reduction in accidents. The accident campaign, by reason of the faithful co-operation of motormen and conductors, proved successful and the management believes that by greater effort and concerted action on the part of motormen and conductors better service can be rendered which will better please the public and result in increased travel, and also in a further reduction in accidents. With this expectation in view it has been decided to set aside \$40,000 out of the accident fund to be paid as a premium, beginning Sept. 16, 1916, at the rate of 1 cent an hour to motormen and conductors in the service as of Sept. 15, 1916."

Increase in Wages in Beaumont.—Notices have been posted announcing an increase of 2 cents an hour in the pay of conductors and motormen employed by the Beaumont (Tex.) Traction Company and the Jefferson County Traction Company. The increase went into effect on Aug. 15.

Reduction in Taxes Asked.—The Northern Texas Electric Company, Fort Worth, Tex., has applied to the city for reduction of taxes. The application states that jitney competition lowered gross in 1915 by \$250,000 and that so far in 1916 loss has been \$150,000. The claim for reduced taxes is based on the depreciated value of the franchise because of jitney competition.

Buffalo City Men to Operate Interurban Cars.—Under the terms of an agreement reached between Nathan A. Bundy, as receiver for the Buffalo (N. Y.) Southern Railway, and its platform men, motormen and conductors of the International Railway will operate cars from the Buffalo city line to the Main Street terminal. Heretofore the interurban men operated cars over the Buffalo tracks.

Contract for Subway Approaches to Cleveland Bridge Awarded.—The board of County Commissioners on Sept. 9 awarded the contract for building the subway approaches to the new Superior-Detroit Avenue bridge across the Cuyahoga River to the Bates & Rogers Construction Company, Chicago, Ill., for \$624,992. The estimate of the cost of the work furnished by W. A. Stinchcomb, county engineer, was \$672,000.

Trenton Working Agreement Signed.—The working agreement between the Trenton & Mercer County Traction Corporation, Trenton, N. J., and its employees, has finally been signed. The agreement is in the same form in which it was decided upon several weeks ago. The men for a time refused to sign it, wanting an additional clause inserted providing certain pay for extra men. The clause was finally left off.

Fenders to be Required in Helena.—Mayor R. R. Purcell of Helena, Mont., says that steps will be taken at once by the city officials to compel the Helena Light & Railway Company to install satisfactory fenders on all cars operated in Helena. This statement comes as the result of the death of Elmer Hoepfner, killed by a car at the corner of Main and Grand Streets. The coroner's jury placed the blame for the accident on the railway.

Baltimore Bridge Franchise Value Fixed.—On Sept. 5, the city of Baltimore, Md., voluntarily fixed the price of the franchise to the United Railways & Electric Company on the New Hanover Street Bridge at \$107,943. Between that figure and the original estimate by the city of the value of the grant there is a difference of more than \$500,000. More than half of the \$107,000 can be paid in five annual installments, if the United Railways & Electric Company so elects.

Northern States Preferred Stock Sales.—During the month of August \$56,800 of 7 per cent preferred stock of the Northern States Power Company was sold to 144 of the company's customers in home territory. Total sales since the stock was first offered to the company's patrons amount to \$801,400 held by 1475 customer-stockholders. The conditions under which this stock is sold to customers were described at length in the ELECTRIC RAILWAY JOURNAL of Aug. 12, page 264.

Birmingham Wage Negotiations Begun.—J. S. Pevear, president of the Birmingham Railway, Light & Power Company, Birmingham, Ala., is quoted as follows in regard to the negotiations covering terms of service for the employees: "There is nothing of interest to the public in what we are doing now. The organization has been recognized by the company, and only the terms of the contract are left to be worked out between the company and the men. The matter will be left to arbitration in the event that we cannot agree."

Lincoln Street Railway May Cease Operations.—In the Lincoln Street Railway cases the Public Utilities Commission of Illinois granted authority to a utility to discontinue completely its street railway operations in the city of Lincoln. The company made a showing for discontinuing an

established utility service, based upon continued annual operating losses. The commission held that the company, with the permission of the city of Lincoln, should not be compelled to continue the further operation of its street railway business.

Laurel Line Increases Wages.—Yardmen, conductors and motormen employed by the Lackawanna & Wyoming Valley Railway, a third-rail electric system operating between Wilkes-Barre and Scranton, Pa., were granted an increase in wages on Aug. 30, following a conference of railway officials and a committee of the employees. The new scale of wages became effective on Sept. 1. It provides, for motormen and conductors on electric locomotives, wages of 40 cents an hour, an increase of 1½ cents; trainmen on local and express service, 35½ cents, an increase of 2 cents; brakemen, 27½ cents an hour, an increase of 1 cent, and switchmen, an increase of 1 cent an hour.

Some Cleveland Questions up for Settlement.—Fielder Sanders, street railway commissioner of Cleveland, has submitted to the City Council a plan for relieving congestion at Euclid Avenue and East Ninth Street. He proposes so to reroute cars that no cars will be allowed to turn at right angles at that corner. During the rush hours vehicles are to be held to the same rule. The Council has asked the Cleveland Railway to report on the desirability of purchasing the track to the North Randall race tracks. The street railway committee has indorsed legislation providing for inclosed steps leading from the Payne Avenue terminal to the 105th Street crosstown line. Accident suits aggregating \$225,000 in damages were filed against the company during the week ended Sept. 2. Seven of the suits were filed by one firm of lawyers. One for \$50,000 was brought by the father of a sixteen-year-old girl who was struck by a car some time ago.

Buffalo Southern Railway Strike Off.—After a series of conferences between a committee of bondholders of the Buffalo (N. Y.) Southern Railway and its employees, which culminated in an agreement on Aug. 31, the strike of platform and trackmen, which has been in effect since last May, has been called off. There will be no increase in wages for the platform men and the same conditions will continue as prevailed before the strike. Platform men are restored to the number required to operate the cars with their former seniority rank and all prosecutions resulting from the strike will be dropped. The men will receive 25 cents an hour for the present and whether or not an increase will be granted later will depend upon the result of arbitration conferences. Trackmen will receive an increase of 3 cents an hour and it is agreed that ten hours shall constitute a day's work and any employment shall be considered as a day. Partial service was restored between the Buffalo city line and Ebenezer, Orchard Park, Armour and Hamburg on Sept. 3, but owing to the damage done by strikers and their sympathizers it will be some time before there is complete restoration of service.

PROGRAMS OF ASSOCIATION MEETINGS

New England Street Railway Club

The outing of the New England Street Railway Club, which is to be held in Springfield and Holyoke on Sept. 21-22, will be attended by the entire membership of the club if the Springfield Street Railway, the Holyoke Street Railway and the other important business interests in those cities have anything to say about it. On Sept. 12, the Springfield Board of Trade, through its convention bureau, sent out a special letter to all members of the club extending a cordial invitation to visit the city and see its many attractions and saying that no pains will be spared to make this outing one long to be remembered. The Holyoke Board of Trade is also showing great interest in the outing and is sending out a letter pointing out the places of interest, industries, etc., in that city and offering to assist in making the visit of the club to that city a memorable one. Finally, lest the members will overlook the eventful date, a series of reminder cards has also been sent out by "Bemis," which is short for the Bemis Car Truck Company. The last of these reminders reads: "If broke, come anyhow."

Financial and Corporate

ANNUAL REPORT

Brazilian Traction, Light & Power Company, Ltd.

The income statement of the Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., in Canadian currency for the year ended Dec. 31, 1915, follows:

Revenue from securities owned and under contracts with subsidiary companies	\$5,339,192
Interest on advances to subsidiary companies	273,683
	\$5,612,876
General and legal expenses, administration charges and interest on loans	218,074
Surplus available for dividends	\$5,394,802
Dividends	4,849,380
Surplus carried forward to profit and loss	\$545,422

While the combined earnings of the companies in Brazilian currency fully realized the expectation of the board, being considerably greater than those of the previous years, the result was not so satisfactory when such earnings were converted into Canadian currency. For some years prior to the outbreak of the European war, the value of the milreis for sight bills on London was approximately 16d. During the latter part of 1914, however, the average value fell to approximately 13d., and in 1915 showed a further depreciation to an average of approximately 12.5d. Converting the earnings during 1915 at the average rates prevailing prior to the war, the net revenue in Canadian currency would be increased by more than \$3,000,000.

During the first half of 1915, dividends on the ordinary shares at the rate of 1½ per cent each were paid on March 1 and June 1 respectively. As, contrary to expectations entertained earlier in the year, the exchange value of the milreis continued to fall, the board decided to limit the dividends payable on Sept. 1 and Dec. 1 to one-half of 1 per cent each, making a total dividend of 4 per cent for the year.

Although rigid economies were effected, the cost of operation and maintenance was adversely influenced by the rise in the price of materials, and by the enormous advance in ocean freights. This advance particularly affected the earnings of the gas business, as owing to the requisition by the British government of some of the steamers employed in the company's service for carrying coal, it became necessary to charter other steamers at rates greatly exceeding those which would have been payable under normal conditions. With a return to normal conditions the revenue of the company should be not only equal to that obtained prior to the war, but should show a considerable and steady increase. Conditions generally in Brazil are showing distinct signs of improvement. All the coffee purchased for exchange purposes during 1914 and at the beginning of 1915 was disposed of, and at prices which realized a sum in excess of that which it is estimated would have been received had the usual method of making remittances been followed.

The operations of the Rio de Janeiro Tramway, Light & Power Company, Ltd., for the year resulted in substantial increases in earnings in all departments except the tramways. The earnings of this department showed a slight decrease. The loss came from the first three months of the year, after which the receipts compared favorably with those in 1914. The passengers carried during the year totaled 191,556,302 as compared to 192,103,635 in 1914, while the car-miles were 24,409,259 and 24,815,078 respectively. During the year the company built and put into operation eleven cars and progress was made on thirty trailers.

The tramways department of the Sao Paulo Tramway, Light & Power Company, Ltd., also showed slightly decreased earnings for 1915, but the present outlook is good, inasmuch as the earnings for the first three months of 1916 exceeded those for the corresponding period of last year. The passenger traffic in 1915 fell off from 53,732,292 to 51,574,145, while the car miles decreased from 9,496,091 to 9,425,231. This branch did little new construction during the year.

FUTURE OF MEXICO TRAMWAY

Bondholders at Meeting in October Will Consider Policy to Be Pursued Pending Improved Mexican Conditions

The bondholders of the Mexico (Mex.) Tramways and all its affiliated companies have been addressed by the National Trust Company, Ltd., Toronto, Ont., the trustee of each of the trust deeds securing the several issues of bonds, in regard to a meeting of the security holders to be held in London, England, on Oct. 4, at which meeting important general questions of policy relating to the future conduct of the companies' business, pending an improvement of conditions in Mexico, will be laid before the bondholders for their approval. The trust company refers to the default in the payment of bond interest on account of the extraordinary conditions which prevailed in Mexico and says that of a total of £12,330,371 of bonds outstanding more than £7,553,066 have been deposited with the committee. The company says that it would have been of little use to convene bondholders' meetings until a policy based upon first-hand information as to the conditions in Mexico could be recommended. It then refers to the study of the properties made by F. H. Phippen and E. D. Trowbridge, referred to at length in the *ELECTRIC RAILWAY JOURNAL* of July 15, 1916, page 118. Mr. Phippen will attend the meeting to amplify his report and answer inquiries. The resolutions intended to be placed before the formal meeting for the approval of the bondholders are as follows:

1. Approving the policy heretofore adopted and the policy recommended for the future as explained by circular letter dated June 27, 1916, issued by the trustee and by the bondholders' committee constituted by agreement dated Feb. 18, 1916.

2. Appointing a committee to represent and act for the holders of all the said bonds and with such constitution and powers as to the meeting may seem advisable.

3. Authorizing and directing the trustee to waive defaults committed or to be committed by the company in payment of interest and sinking fund on the bonds and otherwise on such conditions and for such periods as the meeting may think fit.

4. Determining what steps shall be taken for the protection of the bondholders' interests and to obtain for the bondholders control of the future conduct of the affairs of the company.

5. Authorizing, subject to such conditions and limitations as may be approved by the meeting, the creation and issue of prior lien bonds ranking in priority to the said bonds upon all or any of the assets of the company.

6. Authorizing the trustee to vote or to permit the company to vote at meeting of the bondholders of the Mexican Light & Power Company, Ltd., any bonds of that company held as part of the mortgaged property in favor of resolution similar to those herein referred to.

7. Precluding any bondholder from taking any proceedings against the company on his bonds or the coupons, or for the enforcement of the security therefor without the approval of the said committee.

8. Determining upon what conditions the management and control of the company's assets shall be permitted to remain vested in the board of directors and authorizing the trustee to permit the company to hold and manage, and to exercise voting and other rights in respect of, the mortgaged properties and to receive the income thereof.

9. Authorizing the trustee to concur with the company in executing and doing such supplemental trust deeds, documents and things as it may consider necessary to give effect to any resolutions passed at the meeting, and for the protection of the trustee in carrying the said resolutions, trust deeds and documents into effect, and authorizing the trustee to act upon or in accordance with any direction or resolution of the committee.

10. Generally any other resolutions which the meeting may consider desirable for the protection of the bondholders or for giving effect to the recommendation of the trustee or the bondholders' committee at such meeting.

11. Agreeing to the modification of the rights of the bondholders against the company and its property to the extent necessary to give effect to any such resolutions, supplemental trust deeds and documents.

REORGANIZATION OF ALBIA PROPERTIES

The protective committee representing the holders of the bonds of the Albia (Iowa) Interurban Railway, of which Guy Morrison Walker is chairman, has arranged to organize a new light and railway company to succeed the Albia Interurban Railway, the property of which was sold under foreclosure some time ago. The new company is to be known as the Albia Light & Railways Company. It will take over the property disposed of at foreclosure, paying the committee therefor new first mortgage 5 per cent gold bonds equal to 70 per cent of the par value of the present outstanding bonds of the Albia Interurban Railway and 6 per cent preferred stock in an amount equal to 30 per cent of the par value of the outstanding bonds. In addition, the organizers of the new company agree to secure all the outstanding bonds of the Albia Gas Company and to exchange them for bonds of the same issue as those given to the bondholders so that the new bonds will be a first mortgage on all the property. It further has agreed to pay all the expenses of the committee and raise the necessary cash to pay off the preferred claims, the receivers' fees, etc., so that the committee will be able to distribute the new bonds and the new preferred stock without any deduction for expenses of any kind.

Under the plan, bondholders receive par in new securities for par of old Albia Interurban Railway bonds, 70 per cent thereof in new first mortgage 5 per cent bonds and 30 per cent thereof in new 6 per cent preferred stock. The new bonds will be in the denomination of \$1,000 and \$100. Fractions of bonds less than \$100 and fractional shares of stock will be covered by the issue of script, which will be exchangeable in amounts of \$100 or multiples thereof for bonds and shares of preferred stock. The reorganized company will have authorized and outstanding \$400,000 of common stock of a par value of \$100 and \$100,000 of 6 per cent non-cumulative preferred stock of a par value of \$10. The new bonds are dated July 1, 1916. The total authorized amount is \$500,000, of which \$250,000 are outstanding. Interest is payable January and July at the office of the Empire Trust Company, New York, N. Y. The bonds are due in 1941. There is no sinking fund provided and the bonds are non-callable. The \$250,000 of bonds at present unused are reserved for extensions and additions. During the period that the property was operated by the receivers, the net profits were spent in improvements to the property by order of the court.

The officers of the Albia Light & Railways Company, the successor company, are: Albert L. Fowle, president; Merle R. Walker, vice-president; A. S. Leyland, secretary; Ralph W. Bayer, treasurer.

ELECTRIC RAILWAY VALUES DEPRECIATE

The Washington State Tax Commission, in compiling the regular June schedule for 1916, estimates the depreciation in valuation of the electric railways in Washington on account of automobile competition since the 1915 schedule was compiled, at \$2,747,180. This will reduce taxation receipts from such lines \$48,075. The reports for the year ending Dec. 31, 1915, show decreases in gross and net receipts in both freight and passenger earnings of almost every electric line in the State. This reduction in receipts has prevented enlargements and extensions, and the decrease in valuation is figured on account of depreciation and obsolescence of equipment, formerly overcome by replacement and improvement.

On this subject *The Electrogram* of the Puget Sound Traction, Light & Power Company, Seattle, Wash., said in a recent issue:

"The decreased valuation and consequent loss of taxes from electric railways is of course primarily a loss to the stockholders of the companies, but it is also a loss to all other taxpayers, who must make up the deficit in public revenues, and to patrons of the street railways who will suffer in loss of service as the companies are forced to retrench, owing to losses caused chiefly by unregulated auto competition. The situation is serious enough to cause every thoughtful citizen to consider whether it would not be the best policy to regulate auto transportation just as strictly as electric railways are regulated."

American Railways, Philadelphia, Pa.—Newburger, Henderson & Loeb, Philadelphia, Pa., bankers, have made public a statement in connection with the acquisition of the Electric Company of New Jersey, the Pennsgrove Electric Light & Power Company, the Clementown Township Electric Improvement Company, the Williamstown Electric Company and the Woodstown Ice & Storage Company by the American Railways, referred to originally in the ELECTRIC RAILWAY JOURNAL of June 10 and Aug. 12 in connection with the application of the American Railways to the Board of Public Utility Commissioners of New Jersey, for permission to consummate the purchase. The purchase of these properties dates from Sept. 1. They are taken over through the subsidiary of the American Railways known as the Electric Company of New Jersey. The district served covers territory on a line south of the West Jersey & Seashore Railway and embraces a population of 85,000. Part of the power used will be generated as at present at the power plant at Bridgetown, N. J., owned by the American Railways, and additional current will be supplied directly from Wilmington through a duplicate power system running under the Delaware River and thence by transmission lines to Paulsboro, Salem and other places. The taking over of these properties brings under the single ownership of the American Railways, without competition, the entire electric light and power business of the valley of the Delaware on both sides of the river for a distance of 100 miles.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—Justice Wesley Dudley in the Supreme Court has authorized George Bullock as receiver of the Buffalo & Lake Erie Traction Company, operating between Buffalo, N. Y., and Erie, Pa., to issue \$140,000 of receiver's certificates, \$135,000 of which will be used to retire securities to this amount, and the balance to improve the company's property.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The National City Company, New York, N. Y., and Halsey, Stuart & Company, Chicago, Ill., are offering for subscription \$3,620,000 of first mortgage 5 per cent gold bonds of the Chicago, North Shore & Milwaukee Railroad, the successor to the Chicago & Milwaukee Electric Railroad, dated July 1, 1916, and due on July 1, 1936. The total authorized issue of the bonds is \$10,000,000. They are callable as a whole or in part on any interest date at 105 and interest. The bonds are in coupon form, registerable as to principal, in interchangeable denominations of \$1,000, \$500 and \$100. The Continental & Commercial Trust & Savings Bank, Chicago, Ill., is the corporate trustee.

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The Kanawha Traction & Electric Company has applied to the Ohio Public Utilities Commission for authority to issue \$2,000,000 of bonds. As noted in the ELECTRIC RAILWAY JOURNAL of Aug. 26, page 375, the attorneys for the company recently filed a mortgage dated Aug. 1 with the court at Parkersburg to the Fidelity Trust Company and Van Lear & Black as trustees to secure an issue of \$5,000,000 of bonds to be put out in serial issues of such amounts as the needs of the company require. It was then stated that series A of these bonds would be issued in an amount sufficient to refund \$1,500,000 of two-year 5 per cent notes of the Kanawha Traction & Electric Company due on June 15, 1917, and \$150,000 of bonds of the Marietta Traction Company which mature early in 1917.

Northern Ohio Traction & Light Company, Akron, Ohio.—E. W. Moore, vice-president of the Northern Ohio Traction & Light Company, has announced that 80 per cent of the stock required to bind the sale of the property to Eastern financial interests has been deposited. The agreement provides that 95 per cent of the stock shall be deposited. The meeting of stockholders scheduled for Sept. 12 in Akron was postponed.

Portland Railway, Light & Power Company, Portland, Ore.—The Portland Railway, Light & Power Company has retired the \$87,000 of 6 per cent bonds of the City & Suburban Railway which remained outstanding of the original issue of \$1,000,000. The bonds were dated Sept. 1, 1891, and were due Sept. 1, 1916. Their retirement was provided for under the terms of the indenture securing the first and refunding 5 per cent bonds of the Portland Railway, Light & Power Company.

Youngstown & Southern Railway, Youngstown, Ohio.—The property of the Youngstown & Southern Railway was sold at public auction on Sept. 7 to W. J. Blackburn of Youngstown, who represented the bondholders. The price was \$650,000, two-thirds of the appraised value. On the following day application was made to the Ohio Public Utilities Commission for authority to sell the property to the Youngstown & Suburban Railway for \$1,550,000, a reorganization of the old company. The Interurban Realty Company, a subsidiary of the new corporation, has been organized to take title to about 1000 acres of coal land owned by the Youngstown & Southern Railway at West Point.

DIVIDENDS DECLARED

Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., quarterly, 1½ per cent, preferred.
 Eastern Power & Light Corporation, New York, N. Y., quarterly, 1¾ per cent, preferred.
 Galveston-Houston Electric Company, Galveston, Texas, 3 per cent, preferred.
 Interborough Consolidated Corporation, New York, N. Y., quarterly, 1½ per cent, preferred.
 Interborough Rapid Transit Company, New York, N. Y., quarterly, 5 per cent.
 Kansas City (Mo.) Railways, 2½ per cent, preferred.
 Manhattan Railway, New York, N. Y., quarterly, 1¾ per cent.
 Philadelphia (Pa.) Traction Company, \$2.
 Springfield Railway & Light Company, Springfield, Mo., quarterly, 1¾ per cent, preferred.
 United Light & Railways, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred; 1 per cent, common.
 West End Street Railway, Boston, Mass., \$1.75, common.
 West India Electric Company, Kingston, Jamaica, quarterly, 1¼ per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., July, '16	\$97,834	*\$76,352	\$21,482	\$27,831	†\$6,178
1 " " '15	91,243	*62,182	29,061	17,021	†12,159

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO.

1m., July, '16	\$50,976	*\$24,655	\$26,321	\$11,468	\$14,853
1 " " '15	46,154	*22,690	23,464	11,086	12,378
7 " " '16	261,592	*146,717	114,875	79,630	35,245
7 " " '15	236,091	*134,785	101,306	76,811	24,495

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., July, '16	\$932,505	*\$587,455	\$345,050	\$98,634	†\$270,260
1 " " '15	806,482	*474,990	331,492	98,265	†256,409

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

1m., June, '16	\$476,959	*\$210,273	\$266,686	\$217,661	†\$49,025
1 " " '15	444,458	*193,753	250,705	213,061	†37,644

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO.

1m., June, '16	\$139,003	*\$86,288	\$52,715	\$36,237	\$16,478
1 " " '15	119,734	*78,188	41,595	36,349	5,246
6 " " '16	722,320	*483,885	238,435	217,813	20,622
6 " " '15	625,123	*434,619	190,505	216,276	†25,771

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m., July, '16	\$164,595	*\$90,293	\$74,302	\$36,704	\$37,598
1 " " '15	136,446	*78,781	57,665	36,221	21,444
7 " " '16	886,916	*574,179	312,737	254,517	58,220
7 " " '15	761,570	*513,400	248,170	252,496	†4,326

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m., July, '16	\$44,930	*\$30,663	\$14,267	\$7,987	†\$6,325
1 " " '15	49,783	*30,801	18,982	8,000	†11,053

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., July, '16	\$50,044	*\$44,504	\$5,540	\$8,015	†\$591
1 " " '15	42,611	*43,287	676	\$8,345	†6,676

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., July, '16	\$569,275	*\$371,502	\$197,773	\$120,688	†\$78,599
1 " " '15	472,148	*319,416	152,732	120,284	†33,748

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., July, '16	\$23,125	*\$22,400	\$725	\$1,815	†\$1,064
1 " " '15	26,016	*22,719	3,297	1,590	†1,737

*Includes taxes. †Deficit. ‡Includes non-operating income.
 †Excludes interest on bonds, charged income and paid by the N. Y., N. H. & H. R. R. under guarantee, also interest on notes held by the N. Y., N. H. & H. R. R. not credited to income of that company.

Traffic and Transportation

BOSTON SERVICE INVESTIGATION COMPLETED

Massachusetts Public Service Commission Concludes Extended Study of Service—Present Methods Approved

An extended study of the service of the Boston Elevated Railway in the Jamaica Plain district has been completed by the Massachusetts Public Service Commission, resulting from a petition of Representative Alfred J. Moore and others for restoration of crosstown surface line facilities from Forest Hills to Park Street via Hyde Square. As the result of various changes residents of Jamaica Plain have been deprived of all through service to Forest Hills and have been obliged to make two transfers, one at the Jamaica Plain carhouse and another three minutes later at the Forest Hills elevated terminal station, in order to reach points in the Roslindale, Germantown, Mount Hope and Mattapan districts of Boston, as well as points beyond in Dedham, Hyde Park and Milton. The inconvenience of this arrangement, with respect to transfers at the Jamaica Plain carhouse, will shortly be minimized by improvements at this point. The company is installing additional tracks and loops with suitable facilities for the lay-off of cars and is also constructing a prepayment area which will permit of a bodily transfer being made under shelter instead of in the street.

From all the evidence available, the commission believes that the present method of routing cars from the Hyde Square district is consistent with sound principles of street railway operation and is not at variance with any reasonable standard of public convenience in that district. Most of the travel from the district is on the Dudley Street line, which, in conjunction with the elevated lines from the Dudley Street station, affords the quickest service to the business center of Boston; the Tremont Street line furnishes service without change, and by the most direct route, to all stations in the Tremont Street subway; and for those passengers, relatively few in number, who desire to reach points in the Back Bay district, free transfers are given at Roxbury Crossing and at the intersection of Tremont and Northampton Streets. The commission finds that the number of passengers from the Hyde Square district now making such a transfer is too small to justify an additional through line, and that the inconvenience of the present transfer arrangements is no greater for the people of the Hyde Square district than for the much larger number of persons from Brookline, Cambridge and other suburban communities who must also transfer to reach Huntington Avenue and other surface points in the Back Bay district. The commission says that any attempt to establish through service for every small group of riders on every available route in the Boston Elevated system would result in gross waste of the revenues contributed by the riding public and would be utterly impracticable from an operating standpoint.

Improvements in Jamaica Plain service are now under way. To relieve the congestion of travel during rush hours on the South Huntington Avenue and Dudley Street lines the company has agreed to operate a trailer service in rush hours on both these lines. This service is now in partial operation and is to be increased. An important improvement has also been effected by a rearrangement of stops on Center Street, Jamaica Plain, in the heart of the factory district, so as to permit the simultaneous loading of three single cars or two two-car trains, instead of only one car at a time, as previously. The company has assigned additional men to superintend the loading of these cars at this point, and the inspection department of the commission has been advised by leading factory officials that these arrangements have proved satisfactory to their employees and have also resulted in expediting the entire service over Center Street in Jamaica Plain (the principal artery of travel) during rush hours. In addition to these changes the commission is of the opinion that free transfer privileges should be established at Jackson Square.

TEXT OF PENNSYLVANIA JITNEY DECISION

Commission Holds Jitney to Be a Public Service Company and Requires Certificate of Public Convenience

Brief mention was made in the ELECTRIC RAILWAY JOURNAL of Sept. 9, page 461, of the decision of the Public Service Commission of Pennsylvania holding any one operating a "jitney bus" over a fixed route and regularly soliciting the carriage of passengers for hire to be a public service company within the meaning of the Public Service Company Law and requiring such operator to secure a certificate of public convenience from the commission. The report and order of the commission follow:

"The complaint in this case sets forth that the respondent who is a resident of the borough of Tarentum, Allegheny County, 'is now and has been for some time past engaged in the business of a common carrier of passengers between the village of Natrona and the boroughs of New Kensington, Arnold and Parnassus, Westmoreland County, Pa., and between the boroughs of New Kensington, Arnold and Parnassus and the borough of Aspinwall, Allegheny County, Pa., and that as such common carrier he is the owner and operates a motor-driven vehicle or automobile having State license No. 41,288, commonly known and referred to as a "jitney bus," and solicits and transports passengers between the said and intervening points for hire.'

"In the answer of the respondent submitted under oath these averments are admitted, excepting that it is alleged that he does not travel upon, over and adjacent to the street car tracks of the complainant the full length of the route traversed by him, but travels over only a portion of said route, being the route between Natrona, Brackenridge and through East Deer Township where there is only one public highway used in common by complainant and the general public. For further defense the respondent answers that he is not a common carrier of passengers nor a public service company within the meaning of the act of July 26, 1913, and that he is not subject to the provisions of said act; that if he is a common carrier the act of July 26, 1913, does not apply to him and if it does so apply it is unconstitutional in failing to give notice of said matter in its title.

"At the hearing had upon this complaint the respondent was called and testified that he usually operated between Tarentum and Natrona and Natrona to New Kensington, going usually up Fourth Avenue to Allegheny and from Allegheny to Third Avenue. The automobile employed by him for the service which he was rendering was a five or six-passenger E. M. F. car. Although the affidavit alleged that an application had been presented by respondent to this commission for a certificate of public convenience, the records of the commission negatives the statement.

"Under all the evidence the case comes squarely within the rulings of this commission. In Scranton Railway vs. Walsh (P. U. R. 1916, D. 18), and for the reasons therein stated complaint must be sustained. The complainant is engaged in the business of a common carrier of passengers; for this service he has not applied for nor received from the Public Service Commission a certificate of public convenience authorizing him so to do. An order will, therefore, be issued directing the respondent, W. T. Alter, his servants, agents and employees, to cease and desist from carrying on the aforesaid public service business until he shall have obtained from this commission a certificate of public convenience in approval thereof under and in accordance with the provisions of the public service company law approved July 26, 1913.

"This matter being before the Public Service Commission of the Commonwealth of Pennsylvania upon complaint and answer on file, and having been duly heard and submitted by the parties and full investigation of the matters and things involved having been had, and the commission having on the date hereof made and filed of record a report containing its finding of fact and conclusions thereon, which said report is hereby approved and made a part hereof:

"Now, to-wit, Aug. 25, 1916, the respondent W. T. Alter, his agents, servants and employees, are ordered to cease and desist from carrying on the public service mentioned in the above report until they shall have obtained from this commission a certificate of public convenience in approval thereof under and in accordance with the provisions of public service company law."

BAY STATE STREET RAILWAY FILES NEW FARE SCHEDULE

Following the recent decision of the Massachusetts Public Service Commission relative to proposed fare increases on the Bay State Street Railway, the company has filed a new schedule with the commission covering all the routes on the system outside the fifteen urban groups of lines exempted by the board from higher fares at the present time. The new schedule establishes a 6-cent fare unit in place of the previous 5-cent rate on about 370 routes, the number of proposed increases on the various divisions being as follows: Lowell, sixty-four; Lawrence, forty-six; Haverhill, forty-five; Reading, Woburn and Gloucester, about ten; Lynn, six; Salem, nineteen; Chelsea, three; Fall River, eighteen; Taunton, seventy-two; Brockton, fifty-two; Quincy, thirty; Hyde Park, five. School tickets are to be sold at one-half the regular rates in all divisions. Nearly 300 of the above proposed increases apply to through routes.

Examples of the proposed increases as affecting longer-distance travel on the system follow:

Route—North of Boston	Fare Schedule in Cents	
	Present	Proposed
Merrimack Square, Lowell, and Winthrop Square, Medford	25	29
Merrimack Square, Lowell, and Woburn Square, Woburn	20	23
Merrimack Square, Lowell, and Malden Square, Malden	25	28
Merrimack Square, Lowell, and Haverhill Transfer Station	25	26
Merrimack Square, Lowell, and Massachusetts-New Hampshire State line	10	11
Lawrence Transfer Station and Malden Square	25	28
Lawrence Transfer Station and Reading Square	15	17
Lawrence Transfer Station and Wakefield Square	20	23
Reading Square and Malden Square	10	11
Lawrence Transfer Station and Salem	25	28
Haverhill and Newburyport	20	23
Boston to Marblehead (Scollay Square to Fort Sewall)	15	16

Route—South of Boston	Fare Schedule in Cents	
	Present	Proposed
Fall River and Taunton	25	28
Brockton and Lund's Corner, New Bedford	45	53
Bridgewater Center and Lund's Corner, New Bedford	35	42
Bridgewater Center and East Providence	30	35
Brockton and Nantasket Beach Steamer Landing	30	35
Campello (Brockton) and Mattapan Square, Boston	20	23
Neponset (Boston) and Nantasket Beach Steamer Landing	20	23
Quincy Square and Center Street, Brockton	20	22

No change in through or local fare limits and no change in transfer limits or reduced rate tickets (except school tickets) is contemplated in the new schedule, which is planned to take effect on Oct. 9, 1916. No formal hearings will be required by the commission, and it is expected that the above rates will receive early approval in the light of the finding in the case dated Aug. 31.

INTERNATIONAL RAILWAY ADVERTISES NIAGARA

Large display advertisements are being used in the daily newspapers of Buffalo and throughout western New York by the International Railway, Buffalo, N. Y., announcing the completion and successful operation of the Western Electric-Davis flood-lighting system on the American cataract and rapids at Niagara Falls, N. Y., and the operation of the new Spanish aerial tramway over the Whirlpool in the lower river rapids. These two new attractions at the Cataract City have greatly increased travel over the Buffalo & Niagara Falls division of the International Railway and over the Upper Bridge and Park and River divisions along the Canadian gorge. Cars are now being operated from Buffalo on a fifteen-minute schedule throughout the day and in the early evening traffic has been so heavy a seven-and-a-half-minute schedule has been put into effect. Cars are operated every few minutes over the Park and River division between the Canadian end of the Upper Bridge and the Whirlpool where the Spanish aerial tramway is located. The Niagara Gorge Railway, operating the American gorge route line along the lower river, has put into operation an especially constructed flat car upon which is mounted a powerful electric searchlight. The searchlight car precedes a number of open observation

cars through the Niagara gorge at night on a searchlight trip of the lower river rapids. This has increased travel through the gorge and over the gorge route belt line at night. No extra charge is made for the night trip.

SERVICE TRIPLED TEMPORARILY

The San Diego & Southeastern Railway, San Diego, Cal., recently decided to make some changes in its train service to Encanto, Lemon Grove, La Mesa, El Cajon and Santee. This new service will be put in on trial for a month or two. The purpose of introducing it is to learn whether or not the people residing in these communities are willing to patronize the railroad, as against the jitneys. If the authorities controlling the jitney situation regulate the jitneys satisfactorily and the receipts from the passenger service take care of the expenses, the company expects to put on gasoline equipment consisting of motor cars and trailers and continue the new service indefinitely.

W. Clayton, vice-president and managing director of the company, in a statement which he issued, said in part:

"If the public will patronize the railroad sufficiently to enable it to meet its expenses, we will give them the best possible service in proportion to the receipts. If, on the other hand, the public is not going to patronize the railroad, then we may just as well frankly admit that the railroad cannot continue any longer in the passenger business. The receipts from the passenger service show continuous loss, and, unless we can cover this loss, we shall have to cease entirely running passenger trains over the Cuyamaca branch. All we ask at the present time is that you and the people you represent shall co-operate with the railroad in trying to solve the present situation, which is unsatisfactory to all of us."

For some time only three trains each way have been operated over this division. A general curtailment was found necessary after the storm of last winter, owing to unregulated auto stage and auto truck competition, fully as much as to the fact that great expense was incurred following the damage done by the storm. On Aug. 28 the service was tripled and nine trains each way are being operated between Thirteenth and N Streets and Santee, the present terminal of the road.

PRESIDENT SHOUP PROTESTS JITNEY COMPETITION

Paul Shoup, president of the Pacific Electric Railway, Los Angeles, Cal., has sent a letter to the Board of Public Utilities and to A. L. Stephens, the city attorney, protesting against the operation of jitney buses along the same streets that the street cars use in Hollywood. The letter follows:

"On behalf of the Pacific Electric Railway I desire to enter formal protest against the operation of jitney buses in competition with our Hollywood line using the same streets, for the following reasons:

"1. There are not enough nickels used for transportation in this section to support the two classes of transportation. The 5-cent fare is a very low rate for the distance between the center of Los Angeles and the center of Hollywood. The bulk of the business is carried for a long distance. The average rate per passenger per mile, the density of traffic considered, is far below the normal rate as determined by rates in other cities of like population.

"2. The Pacific Electric Railway has accepted franchises in the city of Los Angeles under certain obligations, as to reduced rates for school children, carrying certain classes of city employees free, certain obligations as to transfers, and as to a dependable and adequate service.

"It has further obligated itself to construct and maintain sections of the streets occupied on Sunset Boulevard between the central section of Los Angeles and the Hollywood district, and on other highways in that district. Since 1910 it has spent on Sunset Boulevard and in the Hollywood-Colgrove section nearly \$1,000,000 in the paving and reconstruction of lines incident to paving.

"It pays 5¼ per cent of its revenues as tax to the State of California and pays also franchise taxes to the city of Los Angeles. Franchises granted this company, under the law likewise laid certain obligations upon the city, direct or implied. At the time of the granting of these franchises

there was no other form of public street transportation except street railways. Against undue competition with street railways the law made provision whereby the other company could not occupy the same street for more than five blocks in one direction, and when a company occupied the same street for five blocks or less it had to pay with the first company its proper share of the burden of investment and maintenance of the tracks jointly used.

"Competition is now being permitted without regard for what may be due a service and investment established under franchise. The jitneys have a nominal tax compared with that the electric railways have to bear. The argument is offered that this tax should be nominal because the investment is so small. The reason the investment is so small is that the public and the railways are furnishing the road-bed free to the jitneys. If this argument had any value at all, then the electric railways should be furnished free road-bed and taxes reduced on the ground that the public had assumed the main investment burden.

"I ask that you give consideration to these conditions, and am registering this protest at this time for the reason that, in my judgment, under the conditions existing this competition, if maintained, in addition to being unjust to the electric railway, will in no great time be of necessity disastrous to the street railway service as it is now being furnished."

Accident on Ohio Road.—One of the limited cars on the Cleveland, Southwestern & Columbus Railway, Willoughby, Ohio, left the track and turned over at Galion on Sept. 7. Eight persons were injured, but only one was seriously hurt.

Two Killed on Michigan Line.—Two persons were killed and fourteen were injured, two fatally, on Sept. 8 in a head-on collision between two cars on the Michigan United Railway at Rives Junction, 10 miles north of the city of Jackson.

Springfield Jitney Cases in Status Quo.—By a stipulation filed by all parties in the complaint of the Springfield (Ill.) Consolidated Railway against operators of jitneys in the city of Springfield, no further action will be taken by the Illinois Public Utilities Commission unless either party desires to reopen the hearings.

Newspaper Campaign Against Jitneys.—Under the heading "The Street Car Versus the Jitney," the San Antonio (Tex.) Traction Company is running a series of large display advertisements in the San Antonio papers in which are set forth the superiority of the street car over the jitney as a means of transportation, and other reasons why the street car should be patronized by the public in preference to the jitney.

New Wall Map of B. R. T. Line.—The Brooklyn (N. Y.) Rapid Transit Company has just issued a wall map, 32 in. by 40 in. in size, showing in colors the surface and rapid transit lines of the system, and in addition the foreign rapid transit lines which form a part of the rapid transit system of Greater New York. The new map shows graphically the magnitude of the territory served by the Brooklyn Rapid Transit System.

Co-operation Toward Accident Prevention.—Street railway operatives and automobilists in Lexington, Ky., have begun to co-operate to reduce the number of accidents on the streets of that city. The safety-first committee of the trainmen's organization waited on the garage owners and the automobile clubs and proposed that they should use special caution, especially when backing or driving out of garages onto the streets. Motormen promised to exercise care when running past such points.

Builds a Public Playground to Aid Safety Work.—A safety-first innovation has been made by the Illinois Traction System in St. Louis, where the company is building a public playground with the idea in view of keeping the children of a congested neighborhood off the street. It will accommodate about 100 children and is equipped with swings, sand piles, shelters and various amusement devices. The playground is located at Twelfth Street, adjoining the company's entrance right-of-way into the city of St. Louis.

Temporary Order Against Abandonment of Line.—A temporary restraining order was granted to the village of Woodville, Ohio, on Sept. 6, to prevent the Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio, from tearing up its tracks through the village streets. The hearing will take place on Oct. 7. Some time ago Theodore Luce, Detroit, purchased the property for \$140,000 and, because it is not paying, decided to junk it. The light plant at Bowling Green is to continue in operation, as it is yielding a profit. Farmers along the line recently appealed to the Public Utilities Commission on the ground that the company has no right to withdraw the service. The road connects Woodville, Pemberville, Scotch Ridge, Bowling Green and Totogany.

Interurban Roads Benefited by Strike Prospects.—Interurban railways at Louisville were thrown into prominence unusual to them during the two or three weeks that the railroad strike threatened. R. H. Wyatt, freight and passenger agent of the Louisville & Interurban Railway, stated that the steam roads' troubles benefited the electric lines. Not only were there numerous inquiries from shippers, who never had made use of the electric lines, as to what service they could expect, but numbers of shippers who had previously used the steam road service turned to the electric lines during the week before the strike was to be called. This and the shortage of cars on the steam lines were credited with a large increase in the business of the electric lines, and everything in the way of equipment of the Louisville & Interurban lines was in full use.

Steam Railroad Reduces Service by Four Trains Daily Because of Jitneys.—Within a month after the paving of the highway between Astoria and Seaside, some 19 miles apart on the Oregon coast near the mouth of the Columbia River, a fleet of jitney buses appeared and absorbed practically all the passenger traffic between these two points. The jitneys did not cut fares, but, on the contrary, established a charge of \$1 for the same trip that could be made by rail for 75 cents. Passengers preferred the jitneys even at the higher rate and within a short time the Spokane, Portland & Seattle Railroad, a branch of which system connects these two cities, was running trains with only two or three passengers to the car. On Aug. 27 the company discontinued the two local trains each way which had formerly been required to handle the traffic.

Exclusive Tourist Right for International Railway.—The International Railway, Buffalo, N. Y., which operates the Park & River division between Chippawa, Ont., on the upper Niagara River and Queenstown, Ont., at the entrance into Lake Ontario, has been granted the exclusive right to carry tourists through the power-house zone in Queen Victoria Park, Niagara Falls, Ont. Military authorities have erected high barbed-wire entanglements in the vicinity of the Canadian-Niagara Power Company's properties and all tourists, except those on cars of the International Railway, are excluded from the zone. Cars are operated through the zone under military guard. The Niagara Falls Queen Victoria Park Commissioners have refused to accede to the request of hack men and chauffeurs for permission to take tourists through the power-house zone. The section of the park cut off from tourists adjoins the Canadian horseshoe falls.

Railway to Install Autos in Sacramento.—The Pacific Gas & Electric Company, Sacramento, Cal., intends as soon as possible to put two automobiles in service to relieve the conditions which exist east of Twenty-eighth Street, from M to T Streets. One of the proposed routes is from Twenty-eighth and M Streets east to Sierra and California Avenues to the upper Stockton Road and thence to Twenty-eighth and P Streets. The other proposed line is from Twenty-eighth and P Streets to Guthrie Station, thence south to the T Street court and from T Street court to Twenty-eighth and T Streets. On arriving at the respective terminals the cars will return over the same routes. By installing this service the company will be in a position to take care of the increased population. It is the intention of the company to operate these machines with carmen in uniform, the driver receiving fares and issuing and receiving transfers the same as the trainmen do on the regular cars of the company.

Market Street, Without Jitneys, a Show Place Again.—The jitneys have been excluded from Market Street, San Francisco, Cal., during certain hours as noted recently in the *ELECTRIC RAILWAY JOURNAL*. This has had a most beneficial effect upon traffic and has resulted in the restoration of the street to its former appearance and attractiveness. In commenting on this feature the *San Francisco Call* said: "Have you noticed the change in Market Street? It looks like the Market Street of old—wide, clean, safe for those who wish to cross it, and traffic moves swiftly and without crowding. That is the ostensible result of the enforcement of the ordinance. It has returned Market Street—at least from 10 o'clock in the morning until 4 o'clock in the afternoon—to its old place in the community. Market Street used to be to San Francisco what Fifth Avenue or Broadway is to New York, or State Street to Chicago. It was the first of the 'sights' shown to the visitor on his arrival in San Francisco."

"Anti-Pass" Law Affects Louisville Lines.—Under provisions of the "anti-pass" law enacted by the last Kentucky Legislature, and effective on Jan. 1, 1917, the Louisville (Ky.) Railway will curtail its reduced fare privileges to teachers and school children, unless the courts interpret the law to the contrary. The law specifically exempts only pupils of public or parochial schools riding to and from school, and school inspectors. There are no school inspectors in Louisville. At present pupils of all private schools in Louisville and all school teachers receive the half-fare privilege. Charters of two of the three Louisville lines which were merged by the Louisville Railway stipulated half rates to students and teachers and the question is whether these provisions apply to the present system as a whole or whether they are nullified by the new law. The attitude of the company is that it would willingly continue to extend the half-fare rates to all students and all teachers if permitted to do so by law.

Union Jitneys Prohibited from Making Special Trips.—Drivers of jitney buses in San Francisco who are members of the Jitney Bus Operators' Union are prohibited from making side trips or charging more than 10 cents for transportation of passengers, according to an order recently issued by the Joint Council of Teamsters, which is the union governing body of all vehicles. This action followed a protest by the Chauffeurs' Union, which claimed that the jitney union is violating the terms of agreement in the union charter which it received. In this charter it was stipulated that jitneys were to be used as jitneys only, and should not compete with taxicabs. Practically all taxis in San Francisco are driven by union chauffeurs, receiving union wages, and it is claimed that the taxi companies threatened to reduce the wages unless jitney bus drivers were compelled to live up to the agreement made when they joined the ranks of organized labor. The judiciary committee of the Board of Supervisors is now considering a regulation which will prohibit the use of jitney buses for any purpose except hauls over specified routes and prevent them from competing with taxicabs or with other cars that are let out for rent.

Considering Jitney Rules in Maryland.—The Public Service Commission of Maryland and owners of jitneys recently threshed out the new rules for pitneys which the commission framed in June. The rules were devised with a view to insuring public safety. More than 300 owners of motor cars were present or represented by counsel during the discussion. Representatives of several large passenger motor lines operating between suburban points appealed to the commission for even stronger regulations which would prevent "tramp jitneys" running on no regular schedule from running in at starting points of regular lines and driving bargains to carry passengers any distance they might care to travel along the regular established routes. The commission agreed to change the rule for determining the maximum carrying capacity of passenger vehicles by providing that 16 in. of seating space be allowed for each passenger, except that this shall not apply when the number of passengers exceeds the carrying capacity of the car's chassis. It was also decided that in case of the larger buses a seat need not be provided for every person provided the capacity of the chassis was greater than the weight of the total seating capacity.

Personal Mention

H. B. Ross, superintendent of the Southern Traction Company at Waco, Tex., was presented with a gold watch recently by the motormen and conductors on the local lines in appreciation of his efforts in securing an increase in wages for them.

S. B. Irelan, second vice-president and general manager of the Bartlesville (Okla.) Interurban Railway, has been appointed manager of the City Light & Traction Company, Sedalia, Mo., to succeed Harry D. Frueauff, whose appointment to the Montgomery Light & Water Power Company, Montgomery, Ala., was noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 9.

James H. Murphy, superintendent of Division 2, South, of the Bay State Street Railway, with offices in Taunton, Mass., has been appointed temporarily to the position of general superintendent of that division, which office has been held for many years by George F. Seibel. Mr. Seibel, who is supervising architect of the buildings for the company, will devote his whole time, temporarily at least, to the mechanical end, and Mr. Murphy will have entire charge of operation of Division 2, South, which includes Taunton, Fall River and Newport. Mr. Murphy has been identified with railway service in Taunton for many years. His first position was that of tow boy. Later he went into the machine shop. Twenty-eight years ago he went to work on the horse cars as a driver. He has also served as starter and dispatcher.

Frank Hammond, general agent of the Birmingham Railway, Light & Power Company, Birmingham, Ala., is the editor of *The Buzzer*, published weekly in the interest of the employees of the company. Mr. Hammond was born in Greenville, S. C., on Nov. 15, 1882. His education was limited to the grammar school. At seventeen he was employed as shipping clerk with the Charleston & Western Carolina Railway, which position he resigned after two years' service to accept a place as freight clerk with the Carolina Supply Company. After about a year's service he resigned on account of ill health and lived in quietude for about a year. In 1903, while visiting friends in Birmingham, he secured a job as bookkeeper with the Standard Oil Company, where he remained for eighteen months, resigning to accept a position as salesman with the Birmingham Railway, Light & Power Company, in February, 1905. He was subsequently promoted to the position of chief salesman, assistant commercial manager, commercial manager, and general agent, which position he now holds.

T. Lee Miller, whose appointment as financial vice-president and efficiency engineer of the Fort Wayne & Northern Indiana Traction Company, with headquarters at Fort Wayne, Ind., was announced in the *ELECTRIC RAILWAY JOURNAL* of Sept. 9, was graduated from Cornell University with the degree of mechanical engineer. Immediately after he was graduated, Mr. Miller became connected with the firm of Marwick, Mitchell & Company, New York, efficiency and cost engineers. While with them he installed the cost and efficiency system for the Buick Automobile Company at Flint, Mich., and also for the Southern Iron & Steel Company of Birmingham, Ala. Upon leaving the last named firm he entered the service of the Toledo Railways & Light Company, Toledo, Ohio, as assistant to F. R. Coates, president. He resigned from that company a year ago last September to become New York manager of sales of the Sangamo Electric Company with particular reference to bringing out the system for the Economy railway meter. It was from the Sangamo Electric Company that Mr. Miller resigned to become connected with the Fort Wayne & Northern Indiana Traction Company. Mr. Miller is an associate member of the American Institute of Electrical Engineers, associate member of the American Society of Mechanical Engineers, member of the American Electric Railway Association, member of the National Electric Light Association, member of the National Geographical Society and a member of the Engineers' Club of New York.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Peoria, Ill.—The Peoria & Chillicothe Electric Railway has received a forty-eight-year franchise from the Council to operate over the tracks of the Peoria Railway to and from the north end of Adams Street. The franchise provides that the company enjoy this right free of any charges or assessments.

Henderson, Ky.—The city of Henderson has passed a twenty-year electric railway franchise which Mayor Johnson will sign, and which will in all likelihood be sold to the Henderson Traction Company. By the terms of the franchise extensions will be added to the present lines and school children will be provided with half-fare rates.

Worcester, Mass.—The Worcester Consolidated Street Railway has received a franchise from the Council to construct a third track in Salem Square. The company was also granted a franchise for an extra track in Salisbury Street to Lincoln Square, to connect its tracks in Channing Street and Cambridge Street and to lay an additional track in West Boylston Street.

Brooklyn, N. Y.—The Public Service Commission for the First District of New York has granted the New York Municipal Railway a two years' extension of time to July 27, 1918, in which to complete the construction and begin the operation of the additional tracks on Fulton Street, Brooklyn, and an extension of two years to Feb. 2 1918, to complete the construction and begin operation of additional tracks on the Broadway line.

Buffalo, N. Y.—The International Railway has petitioned the City Council for permission to lay double tracks and operate cars in Elmwood Avenue, from Hertle Avenue to the north city line, a distance of almost ½ mile. No opposition has developed and it is expected this application, together with the company's request for a franchise to lay double tracks and operate cars in Franklin Street from Chippewa to Allen Streets, a distance of ½ mile, will be submitted to voters for approval at the next general election in November.

Lackawanna, N. Y.—Application has been made to the City Council of Lackawanna by George Bullock as receiver for the Buffalo & Lake Erie Traction Company for a franchise to lay tracks and operate cars through Sixth Street from the Hamburg Turnpike and across C Street to property being purchased by the company from the Stoney Point Land Company for the purpose of erecting a carhouse.

East Cleveland, Ohio.—The J. L. Free Land Company has received from the Council of East Cleveland a twenty-five-year franchise to construct a line on Noble Road between Euclid Avenue and Mayfield Road. [March 4, '16.]

TRACK AND ROADWAY

Selma Street & Suburban Railway, Selma, Ala.—Plans are being made by this company to build an extension of its Selma Avenue line to the municipal swimming pool.

Pinellas West Coast Railway, St. Petersburg, Fla.—It is reported that this company will be in the market for 60-lb. relaying rails for a 1½-mile line. H. C. Case, president. [Sept. 9, '16.]

St. Petersburg-Tampa Railway, St. Petersburg, Fla.—The survey for this company's proposed line from St. Petersburg to Tampa will be made by C. E. Bursleson, St. Petersburg. George S. Gandy, Sr., St. Petersburg, president. [Aug. 12, '16.]

West Coast Electric Railway, Sarasota, Fla.—It is reported that Philadelphia capitalists have financed this company's proposed line between Tampa and Sarasota. It is estimated that the cost of the project is about \$700,000. A. E. Townsend, Sarasota, general manager. [Aug. 26, '16.]

Georgia Railway & Power Company, Atlanta, Ga.—It is reported that this company's extension to Emory University will be completed by Sept. 27.

Aurora, Mendota & Western Railroad, Aurora, Ill.—This company, which proposes to construct a line between Aurora and Mendota, has applied to the Public Utilities Commission of Illinois for permission to issue \$450,000 of stock. [Aug. 12, '16.]

East St. Louis & Suburban Railway, East St. Louis, Ill.—Work has been begun by this company constructing new track on Collinsville Avenue from Illinois Avenue to St. Clair Avenue.

Muscatine, Burlington & Southern Railway, Muscatine, Iowa.—Plans are being considered for equipping the Muscatine, Burlington & Southern Railway for electrical operation. Negotiations, it is understood, are now under way for the purchase of electric motor equipment.

Kentucky Traction & Terminal Company, Lexington, Ky.—A report from this company states that extensive plans are under way for the improvement of the bathing beach and bath houses at Blue Grass Park, prior to the opening of the season in 1917.

Biddeford & Saco Railroad, Biddeford, Me.—This company will extend its tracks up North Street to the Eastern division of the Boston & Maine Railroad. It is reported that eventually a loop will be built to connect with the present line at the corner of Elm and Main Streets.

Bay State Street Railway, Boston, Mass.—This company is installing a block-signal system on its Fall River and Taunton branch. Work will soon be begun by the company installing iron and steel poles on Main Street, Gloucester, in place of the wooden poles now used.

Boston (Mass.) Elevated Railway.—Work has been begun by the Boston Elevated Railway, reconstructing its tracks on Salem Street from Converse Square to Auburn Street; 110-lb. girder rails are being used.

Worcester (Mass.) Consolidated Street Railway.—Work will soon be begun by the Worcester Consolidated Street Railway double tracking its line on Hamilton Street.

United Railways, St. Louis, Mo.—The northern extension of the Taylor line of the United Railways from Florissant Avenue to Broadway, was opened for regular traffic on Sept. 1. This extension connects the manufacturing district of North Broadway and Baden with the residential districts of West and Northwest St. Louis. The Lee and Seventh Street lines of the company have been merged. The Seventh Street line formerly operated north to Morgan Street and the Lee line south to Pine Street, and thus doubled the congestion. Hereafter the southbound cars will operate east on Carr Street to Broadway, to Elm Street, to Seventh Street, and thence over the old Seventh Street route. Northbound cars will turn east at Seventh and Elm Streets, instead of north, go to Broadway, to Lucas Avenue, and thence over the old Lee line route. The cost of the change was about \$11,000.

International Railway, Buffalo, N. Y.—The work of laying double tracks in Bailey Avenue, from Seneca Street to Broadway, more than 2 miles, is being rushed by the International Railway in an effort to complete the work before winter. This is the first of the 6-mile stretch of track to be laid in Bailey Avenue from Seneca Street to the north city line under the new franchise. The line will greatly relieve the congestion on the Fillmore Avenue and Abbott-South Park lines, especially to and from the large mills and other industries in the South Park section of the city. With the completion of this line the company will be in the market for additional equipment. All available cars are now in use during the rush-hour periods. The company has completed the laying of new double tracks in Main Street from the Cold Spring carhouse to Hertle Avenue, 2½ miles. Work has been in progress since early spring, and despite the heavy north and south bound traffic over this line, service was not seriously interrupted. Cars were operated over a single track for a few blocks at a time while laborers were laying the second track. For a few days while switches and cross-overs were being laid in front of the Cold Spring carhouse, all cars which operated in Main Street were rerouted over East Ferry and Jefferson Streets to Main Street.

Interborough Rapid Transit Company, New York, N. Y.—During the week ended Sept. 9 the Public Service Commission for the First District of New York received bids for the installation of tracks on the Seventh Avenue branch of the Lexington Avenue line. The low bidder on the contract was Engel & Hevenor, New York City, the unofficial total of whose bid was \$229,440. The Ramapo Iron Works, New York City, was the low bidder at \$11,427 for the supply of special work, including frogs and switches and necessary appurtenances to be used in the construction of the Southern Boulevard and Westchester Avenue branch of the Lexington Avenue subway. Bids will be received by the commission on Sept. 28 for the construction of a railroad yard in connection with the White Plains Road extension. The yard will be located one block east of White Plains Road and will cover an area of several city blocks. Further references to these contracts are made on page —.

East Cleveland, Ohio.—It is reported that construction will be begun this fall by the J. L. Free Land Company on its proposed line on Noble Road between Euclid Avenue and Mayfield Road. The cost of the line is estimated at \$35 000. [March 4, '16.]

Philadelphia, Pa.—Following the announcement by Mayor Smith that a \$10,000,000 portion of the new city loan is to be floated by a bond issue Nov. 1, Director Twining, of the department of city transit, announced on Sept. 7 that estimates for work on three sections of the huge subway loop would be called for in a few months and that the contracts would be awarded in January. It is estimated that about one-quarter of this \$10,000,000 will be devoted to transit and port improvement purposes. According to Director Twining, the major portion of the 1917 construction work will have to do with the subway loop and the Frankford elevated. The preliminary plans for this work will be passed upon by the Public Service Commission engineers within a week or so. After this the department will immediately proceed with the plans in detail. Director Twining, speaking of the loop contracts, explained that those for the Eighth Street, the Locust and Arch Streets sections would be awarded first, while the Broad Street section, which involves the more difficult engineering problems, will be awarded two or three months later. Director Twining believes the Frankford elevated will be completed as far as Ridge Street by the end of 1917. Several other contracts, principally for work in the City Hall section, will be awarded some time at the end of the present year, it is said. This will probably include the City Hall station.

Philadelphia & Garrettford Street Railway, Upper Darby, Pa.—Work has been begun by this company on the construction of an extension from Parker Avenue, Collingdale, to the Chester turnpike in Sharon Hill. William J. Torrington Company, Philadelphia, has the contract for the work. It is stated that the company contemplates the construction of an extension to Chester.

Bristol (Tenn.) Traction Company.—Announcement has been made by this company that on Oct. 1 car service on its 3-mile belt line on the Virginia side of Bristol will be discontinued owing to jitney opposition.

Beaumont (Tex.) Traction Company.—Work has been begun by this company on the reconstruction of its tracks on Magnolia Avenue with heavy rails.

Marlin-Temple Interurban Company, Marlin, Tex.—With impressive ceremonies attended by citizens from Marlin and Temple and other towns which the Marlin-Temple Interurban Company will touch, the cornerstone of the bridge over the Brazos River, 6 miles from Marlin, was laid on Sept. 9. S. D. Hanna, chief engineer said this was the beginning of actual construction work which will be pushed till the road is completed. [Sept. 2, '16.]

Ogden, Logan & Idaho Railway, Ogden, Utah.—Construction work has been completed and operation begun on the new cut-off of the Ogden, Logan & Idaho Railway between Hot Springs and Brigham City. The new line is located from ½ to 2 miles west of the present line between Brigham City and Hot Springs and represents an expenditure of about \$300,000. The old line will be operated from Brigham City to Willard about 8 miles, but for the remainder of the distance to Hot Springs the track will be torn up.

Puget Sound Traction, Light & Power Company, Bellingham, Wash.—The Puget Sound Traction, Light & Power Company is expending thousands of dollars this year in improving its roadbed and tracks in Bellingham. The company also is completing the renewal of two bridges across Whatcom Creek, and in addition to this will soon have laid a considerable amount of new 80-lb. rails on Harris Avenue. The Pacific Northwest Traction Company, also of the Puget Sound Traction interests, is making considerable improvements, including roadbed, rails, etc.

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The Merydith Construction Company, Marietta, Ohio, has received a contract from the Kanawha Traction & Electric Company to erect a reinforced concrete viaduct. The cost of the viaduct is estimated at \$60,000.

***Marengo, Lake Geneva & Northern Railway, Marengo, Wis.**—It is reported that the Cortlandt Engineering Company, New York, has been awarded a contract by the Marengo, Lake Geneva & Northern Railway for the completion of its line from Marengo to Delavan, Wis. A \$700,000 bond issue has been taken by the Cortlandt Engineering Company.

SHOPS AND BUILDINGS

Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa.—This company has awarded a contract to H. A. Maine & Company, Waterloo, for the construction of a new terminal station at Fourth and Mulberry Streets, Waterloo. It is stated that the structure will cost about \$75,000.

Hutchinson (Kan.) Interurban Railway.—This company reports that during October and November it will construct a new carhouse with a capacity of twenty-four cars.

International Railway, Buffalo, N. Y.—The Frontier Electric Railway, owned by the International Railway, has been granted an extension of time by the North Tonawanda City Council until Aug. 1, 1920, within which to complete the freight terminal which will be constructed in North Tonawanda along the line of the road which it is building between Buffalo and Niagara Falls, N. Y.

POWER HOUSES AND SUBSTATIONS

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—This company has recently completed a 1300-volt transmission line 11 miles long from its main line near Manzanola to Olney Springs and Crowley. The energy will be used for lighting and power purposes in the two towns as well as by the farmers and ranchers en route. A line has also been extended to Cheraw.

Jacksonville & St. Augustine Public Service Corporation, St. Augustine, Fla.—It is reported that this company is contemplating the construction of an electric plant. T. R. Osmond, St. Augustine, general manager.

Indiana Railways & Light Company, Kokomo, Ind.—This company reports that it has purchased one 5000-kw., 80 per cent power factor, General Electric turbo-generator and Wheeler Condenser & Engineering Company surface condenser for delivery next spring.

Schuylkill Railway, Girardville, Pa.—This company contemplates the construction of a new power plant at St. Clair.

Pennsylvania Railroad, Philadelphia, Pa.—A 20,000-kw., 11,000-volt, 25-cycle, turbine unit complete with a 24,000 sq. ft. surface condenser and auxiliaries, has recently been ordered by the Pennsylvania Railroad from the Westinghouse Electric & Manufacturing Company of East Pittsburgh, Pa. This turbine is for installation in the company's Long Island City power house, which supplies power for the operation of the Pennsylvania Terminal and the Long Island Railroad.

Reading Transit & Light Company, Reading, Pa.—This company will erect a new transmission line to Kutztown.

Galveston (Tex.) Electric Company.—This company has purchased additional ground just north of and in the same block with its power station at which current for operating the Galveston traction lines and lighting the city is generated. According to A. H. Warren, general manager, this land is purchased as a site for an addition to the power plant when the same is needed, which is expected within the next few months.

Manufactures and Supplies

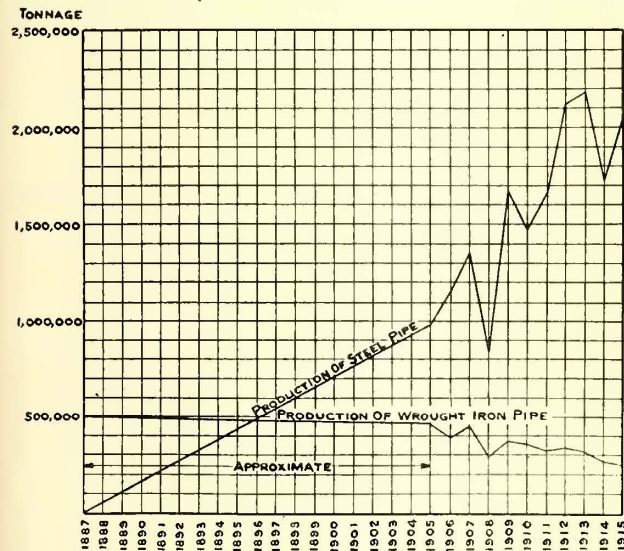
PRODUCTION OF STEEL PIPE

Doubles in Last Ten Years Due in Large Measure to Growth of Electric Railways

In 1896 the production of steel pipe first equalled the production of wrought-iron pipe. Since then the rate of increase in steel pipe production has been very rapid, while the production of wrought-iron pipe has fallen off.

These statements are based on figures issued by the National Tube Company and on statistical data contained in a special bulletin on the production of iron and steel issued by the American Iron and Steel Institute. The data are graphically presented herewith.

The growth of electric railways and their widespread rehabilitation in cities have in no small way accounted for this increased demand for steel piping. Steel piping has a



COMPARATIVE PRODUCTION OF STEEL AND IRON PIPING

great many uses in the electric railway industry. It is employed for steam and other piping and for boiler tubes in power generating stations, and it is used, as well, in very large quantities for street trolley poles as installed within city limits and for trolley car poles, passenger railings, conduits and in the more common services in various railway buildings.

Steel pipe was first made in 1888. The tonnage that year was 300, while last year 2,037,266 tons of skelp was produced for the manufacture of steel pipe.

TO INCREASE SALES IN THE FAR EAST

Special Government Agent Rhea Will Start Next Month on Extended Tour to Benefit Manufacturers of Electric Railway Apparatus

Frank Rhea, who has recently been appointed special agent of the Bureau of Foreign and Domestic Commerce, Department of Commerce, to investigate the field for American railway and tramway supplies in the Far East, expects to leave Seattle Oct. 25 and his first objective point will be New Zealand. He then expects to visit Australia, the Philippines, China, Japan and Manchuria, Straits Settlements, India and South Africa, then go to London, where he expects to arrive in about twenty months. In the meantime he is interviewing manufacturers and others interested in the trade in railway and tramway apparatus in the Far East. Among others seen have been The J. G. Brill Company and the Baldwin Locomotive Works.

As stated in the issue of Aug. 26, manufacturers and

others who wish to get in touch with Mr. Rhea before he leaves this country should address the division of commercial agents, Bureau of Foreign and Domestic Commerce, Custom House New York. This is the new office opened in New York by the bureau to keep in closer touch with business houses interested in foreign trade.

Mr. Rhea has had an experience which well fits him for this investigation of railway trade conditions. After graduation as a civil and electrical engineer from the University of Pittsburgh in 1892, he was a member of the force of the Union Switch & Signal Company for fifteen months. He then went with the Pennsylvania Railroad as foreman of signals at the Broad Street Station for one and one-half years. He resigned from this position to become connected with the Philadelphia Telephone Company, but after a short time returned to the employ of the Pennsylvania Railroad. He was then for five and one-half years signal inspector of the Pennsylvania Lines West and following that for seven years engineer maintenance of way of the same system. This was from 1896 to 1908. In the latter year he joined the General Electric Company, and for five years was connected with the railway commercial engineering department of that company. In 1913 he resigned to join the valuation force of the Interstate Commerce Commission and until his present appointment has been engineer of the Eastern District.

TRACK BONDING AT A MAXIMUM

Delayed Work of the Last Three Years Accounts for Large Increase in Bonding

Notwithstanding the fact that the cost of copper has forced the manufacturers greatly to increase the selling price of rail bonds, the quantity sold so far this year has far exceeded that sold during the corresponding period last year. These statements are confirmed by officials of several bond manufacturers. No doubt the main reason for the comparatively large amount of bonding work that is being done this year is that very little work was done during the years of 1913, 1914 and 1915. Traffic conditions in those years forced the roads to restrict their purchases, and therefore no bonding was done except that which was absolutely necessary. This statement while true for the country as a whole of course does not apply to all roads. Some of the interurban lines which installed signals rebonded all of their tracks within the signalled territory, since good bonding is essential to the proper working of a signal system in which the track rail circuit is required for control.

The Electric Railway Improvement Company, Cleveland, Ohio, reports that for the first half of 1916 it did considerably more business than for the same period in 1915. This company has recently taken over the Cleveland Railbond Company and will manufacture and sell the Cleveland patented bonding machines in addition to promoting the sale of Erico bonding cars and bonds for application by the electric welding process.

Another large manufacturer reports that while his rail bond business for the first half of 1916 was large, as compared with 1915, the orders during July and August fell below those for the previous six months. However, it is to be expected that a reduction in orders will take place as the bond season nears a close.

The largest bonding jobs now under way are in New York City, where the heavy third rails of the New York Municipal Railway and the Interborough Rapid Transit Company's new extensions are being very heavily bonded. The Interborough third rail weighs 175 lb. per yard and will be bonded with bonds having an equivalent of 3,000,000 circ. mil.

ALUMINUM TRANSMISSION WIRE PROBABLY AVAILABLE DURING 1917

Conditions in the producing and selling divisions of the aluminum industry have been such that for some time the Aluminum Company of America has not been in a position to offer its wires and cables for sale to the electric railway and transmission industries. Notwithstanding the fact that production has been speeded up to the greatest possible extent, the demand for aluminum has been so great that the manufacturer has been constrained to distribute its sales particularly to those fields in which there is no substitute

for aluminum. The price of aluminum has been exceptionally high, due in particular to the European war. One large producing plant in Canada was commandeered by the Canadian government and this reduced the production. In England the government has restricted the use of aluminum to war materials only, and in this country the improvements in automobile design calling for a greatly increased amount of aluminum per automobile manufactured, coupled with the enormous increase in the number of automobiles sold, has created an abnormal demand for aluminum. However, the Aluminum Company of America, through one of its officials, has stated to a representative of this paper that during 1917 it expects to re-enter the electric railway and transmission fields for the sale of its products and particularly for the sale of its steel core aluminum transmission cable which has given such excellent service during the last few years.

A NEW FIRM OF ENGINEERS

F. H. B. Paine, William McClellan and H. T. Campion announce the formation of the engineering partnership of Paine, McClellan & Campion, with offices at 25 Church Street, New York City, and 1420 Chestnut Street, Philadelphia.

Mr. Paine is the son of Charles Paine, prominent a few years ago as a railroad engineer and executive. He began his electrical career in 1886 as a student with the Westinghouse laboratories in Pittsburgh, and during the following twenty years took an active part in many electrical enterprises both in this country and abroad. In 1905 he became general manager of the construction work of the Ontario Power Company. This was the earliest large development of long distance transmission in this country. Later he took charge of the development of the Niagara, Lockport & Ontario Power Company, finally becoming its vice-president and general manager. In 1911 he opened an office in New York as a consulting engineer and counsellor to public utilities. He has specialized in valuations and appraisals, rate-making, management and organization, as well as all problems of intercorporate relations, contracts, etc. During this time the New York Telephone Company called him to become chairman of the committee of appraisal in connection with the New York rate case before the Public Service Commission. He also is the representative of the American Institute of Electrical Engineers on the joint national committee of overhead and underground line construction.

A résumé of Mr. McClellan's life was given on page 378 of the issue of this paper for Aug. 26, when announcement was made of his appointment as dean of the Wharton School of Finance and Commerce of the University of Pennsylvania.

Mr. Campion was connected for a number of years with the Philadelphia Rapid Transit Company and its predecessors, finally becoming assistant to the chief engineer, William S. Twining. His particular responsibilities here were the design and construction of carhouses, substations and powerhouses. About 1905 he left the Philadelphia Rapid Transit Company to take charge of the Philadelphia office of the Reinforced Cement Construction Company, and had charge of the reinforced concrete forebay work of the Ontario Power Company at Niagara Falls. In 1907 he associated himself with Mr. McClellan, mentioned above, to carry on a constructing and consulting engineering business.

J. A. HANNA JOINS J. G. BRILL COMPANY STAFF

J. A. Hanna announces that on Oct. 1 he will become associated with The J. G. Brill Company and will resign as vice-president and sales manager of the Niles Car & Manufacturing Company, Niles, Ohio.

The Niles company is now directing its greatest efforts toward the automobile motor truck business. Last year when electric railway car orders were very scarce, it started to build motor trucks in order to keep its shops busy and this business has shown such progress that the major portion of the Niles capital and plant will henceforth be devoted to the manufacture of motor trucks.

Mr. Hanna states that for the present he will retain his office at the Niles Car Works and thus be in position to assist in the completion of Niles car orders still unfilled.

Joe Hanna, as he is familiarly called by so great a number of electric railway men, has been a faithful adherent to the car building business for more than thirty years. He first was engaged in the service of The J. G. Brill Company in 1884 and remained with them seven years as storekeeper, cost estimator, truck expert and salesman. During the following twenty-five years he acted at different times as sales agent for Jewett, Stephenson and Niles cars and for McGuire, Peckham and Baldwin trucks, with offices in New York, Chicago, Philadelphia, Cleveland and Niles. Mr. Hanna on Oct. 1 also will resign as district sales agent for the electric truck department of the Baldwin Locomotive Works.

DELIVERIES MADE AS GOODS ARE COMPLETED

Some electrical manufacturers are now so crowded with orders waiting to be filled that some of them are shipping machinery in parts as completed. That is to say, if a generator is ordered, and the exciter is ready for shipment a month or two in advance of the generator itself, the exciter is boxed up and shipped to the buyer, while it may be some weeks after before the generator will arrive. Likewise, if an order came in for a number of motors of different sizes, the buyer would probably receive the motors in odd lots. This has become necessary so as to make available every possible square foot of factory space for operation in spite of the increased shipping cost.

ROLLING STOCK

Manhattan City & Interurban Railway, Manhattan, Kansas, is contemplating the purchase of two one-man cars.

Schuylkill Railway, Girardville, Pa., has ordered four cars from The J. G. Brill Company for delivery about Dec. 15.

TRADE NOTES

Ohio Brass Company, Mansfield, Ohio, has received an order from the Connecticut Company for 15,000 trolley ears.

Westinghouse Traction Brake Company, Wilmerding, Pa., has received an order for air brake equipment for the forty-two elevated cars recently ordered from the Pressed Steel Car Company by the Boston Elevated Railway.

Homer C. Johnstone, formerly with the Midvale Steel Company, has been appointed manager of the steel department of Gaston, Williams & Wigmore, Inc. Mr. Johnstone served for fourteen years as manager of the Chicago and New York offices of the Midvale Company and is well known in the steel trade.

Edison Storage Battery Company, Orange, N. J., announces the opening of its Los Angeles office in the San Fernando Building. James F. Rogan, who has been acting as local distributor of Edison storage batteries at Los Angeles, will become resident manager. This company also maintains two other offices on the Pacific Coast, one at 206 First Street, San Francisco, in charge of District Manager E. M. Cutting and another at 65 Columbia Street, Seattle, with F. C. Gibson as resident manager.

ADVERTISING LITERATURE

Carnegie Steel Company, Pittsburgh, Pa., has issued a pamphlet on bulb sections.

General Electric Company, Schenectady, N. Y., is distributing a booklet entitled "Railway Line Material for Direct Suspension," containing detailed descriptions of overhead line devices.

Stow Manufacturing Company, Binghamton, N. Y., has issued bulletin No. 100 on electric motors; bulletin No. 101 describes and illustrates electric tools and bulletin No. 102 on flexible shafts.

Lincoln Electric Company, Cleveland, Ohio, has issued a booklet on induction motors for 2 or 3-phase alternating current. This booklet contains a number of illustrations showing installations.

Alexander Milburn Company, Baltimore, Md., has issued a booklet on oxy-acetylene welding and cutting apparatus. This booklet outlines the process of welding and cutting and contains a number of illustrations which show the equipment in operation.