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ELIMINATING A NON-PRODUCTIVE ITEM The conversion of two private cars into revenue-producing parlor cars on the Empire United Railways, which is described upon another page of this issue, is something more than an ingenious adaptation of a means at hand to develop untapped sources of revenue. It is a step that is singularly significant of the best spirit of the times. The use of private cars for officials may have been magnificent, but it is not railroading, and the so-called business car, with its burden of overhead charge that brings no return, is an anomaly in the present day of real business principles. On the Empire United Railways the converted cars in parlor-car service have brought thus far a direct annual return at a rate of less than \$4,000 each, and this is very much below the average earnings of a standard car in regular operation. But, on the other hand, these receipts are amply sufficient to pay for operating the cars, and since no new investment is involved in their operation, the indirect return that has come in this instance through the stimulation of traffic may be entered as a clear gain.

LARGE LAMPS IN CAR WIRING The introduction of the high-efficiency incandescent lamp within the past few years seems to have brought with it at least one problem of considerable intricacy. This is the question whether it will pay to rewire a car for the gain that comes through the use of a few large-capacity lamps instead of a large number of small-size units. When the industry had nothing better than the carbon filament lamp, the problem did not exist, because the carbon filament, with its low light-producing ability per unit of current, at least had the very definite advantage of almost indefinite ruggedness—something that seems to be lacking in the tungsten filaments even under latest methods of manufacture. In consequence, the matter of filament thickness and consequent physical strength has become an important factor in lamp life. Thick filaments, of course, are permitted only when the current flow is large, and the lamp of maximum size is thus able to withstand the greatest and longest-sustained vibration, such as is inevitable upon a railway car. Indeed, experience has amply demonstrated that the smaller lamps do not stand up in railway service as well as the larger sizes, and since the latter are now known to give a satisfactory lighting arrangement, their use should be the aim for all lighting schemes. Although there are, no doubt, instances where the expense of rewiring a car to permit their installation is unwarranted, there are also many

cases where the reverse is true, and in either event the problem holds enough of importance to be worthy always of consideration.

THREE-WIRE SYSTEM IN LOS ANGELES The proposed installation of the three-wire system in Springfield, Mass., as recorded in the issue of this paper for Dec. 18, makes the description of an actual installation of the three-wire system of distribution in Los Angeles of especial interest. The author is S. H. Anderson, electrical superintendent Pacific Electric Railway, and the system has been in use by that company for more than a year. From this fact and the length of line equipped, 125 miles, it will be seen that the test has been conducted for a considerable time and on a fairly good-sized scale. The news that the three-wire system is in such extended use in Los Angeles will, we believe, be of considerable surprise to a great many electric railway engineers, as little has been said about the system up to this time. We assume that this has been the case not so much because of uncertainty on the part of the railway officials as to the efficacy of this method of reducing the track voltage, but of doubt as to whether the operating conditions of the property would prove there, as elsewhere, to be incompatible with the necessities of operation under the three-wire method. But evidently the troubles experienced in other cities have been overcome by care in the engineering layout of the distribution system, and the difficulties of lack of balance have not been experienced.

RISING CAPITAL COST That the cost of railway capital has risen in recent years is a statement generally accepted without argument as being true, but when one finds definite figures on this rather intangible subject they are interesting if only as corroborative evidence. For this reason we pass on to our readers the illuminating data just compiled by the Bureau of Railway News and Statistics. Taking as a basis the listings of steam railroad bonds on the New York Stock Exchange since 1900, this bureau finds that since 1905, when the issues at 4 per cent or under reached the high point of 95.8 per cent of the total of \$538,584,000 listed, the issues at such rates have gradually decreased until in 1915 they represented only 9.77 per cent of the total of \$325,655,000 listed. Of course, the nominal interest rate on bonds does not necessarily indicate the cost of the capital acquired, on account of discount and premium sales, but for railroads as a whole the nominal rate approaches the effective rate with sufficient ap-

proximation to indicate that the cost of railroad capital is showing an upward tendency. If one were to include with the bond listings the short-term note issues, which at 5 per cent and 6 per cent have in the last few years increased rapidly in use, the rising tendency would be still more apparent. It is important also to note that in 1905 \$245,961,000 or about 45 per cent of the bond listings were for new capital and the remainder for refunding, but that the amount devoted to the former use reached as low a point as \$78,624,000 or 24 per cent in 1915. These figures prove nothing numerically so far as electric railways are concerned, but they do indicate what is as true for these carriers as for steam railroads—that rising capital cost under stationary rates and unrestricted expense burdens is not the proper prescription for transportation development. If the public has so increased the transportation hazard that a further gradual rise in capital cost is inexorable, then it must assume the burden or forego the needed development.

FREIGHT AND COST OF LIVING

An undertaking of more than usual interest in connection with the ever-present problem of reducing the cost of living is being projected in Los Angeles. This is the erection of a new large market for the sale of foodstuffs and other farm products which will be brought directly to the market by the cars of the interurban electric railway system which centers in Los Angeles. In fact, the market is to be erected on land now belonging, in part, to the Pacific Electric Railway, although that company has no direct financial interest in the proposed undertaking.

For years a number of interurban lines, particularly in the central states, have been of great service to the farmers as carriers of their products directly to the cities, and the milk car has been a part of the equipment of a number of roads. We believe, however, that it was Prof. Clyde L. King of the University of Pennsylvania who first showed the importance of a system of cheap electric transportation directly from the farmer to the markets of a city, and the effect which such a system would have upon the cost of living, in a report made in 1913 to Mayor Blankenburg of Philadelphia. Professor King made a very careful analysis of the subject and found that if some system of direct transportation from the produce farms to the markets could be arranged it would obviate three very serious factors in the cost of retailing fresh vegetables and other foodstuffs. The first was the transportation from the farm to the steam railroad freight station. The second was the delay on the steam railroad in taking the foodstuffs to the freight station in the large city. The third was the cost of delivery from the freight station to the market. His proposed remedy was, in brief, direct routing from the farm to the market.

This is what the Los Angeles installation proposes. In other words, it is the first step, certainly on a large scale, to meet the economic question of reducing the cost of living in large cities by introducing the most economical method of bringing the farmer and the con-

sumer together. If the experiment in Los Angeles proves successful, a larger field of usefulness for the electric roads should be opened up by this method.

SALVAGE VALUES IN ELECTRIFICATION

In discussions of the commercial possibilities of steam railroad electrification the question of salvage value obtained from the released steam locomotives has rarely received very serious attention. This has, perhaps, been due to the fact that, until the present time, there has been little definite information upon which to base conclusions, with the result that estimates have ranged between wide limits. In general, they have erred on the side of conservatism and apparently in most cases have been lower than necessary.

The recent completion of the Norfolk & Western electrification, however, has given at least a definite basis upon which to consider the matter. In this case the electrified zone is practically a separate division of the main line. Prior to electrification a definite number of steam locomotives of a single type were assigned to do the work of the division, and when electric operation began these machines, thirty-four in number, were replaced by twelve electric locomotives. The substitution was complete, and except for the effect of a steadily rising tonnage, the twelve electric engines are now doing exactly the same work that was done by the thirty-four steam machines.

The standard type of steam engine that was displaced in this case weighed about 540,000 lb., including the tender, and the new value, which may be set at about 7½ cents per pound, would thus be \$40,500 for each machine. The thirty-four engines displaced by electricity would then be worth \$1,375,000 or some 45 per cent of the announced cost of the whole electrification.

On the Chicago, Milwaukee & St. Paul electrification now under construction, forty-two electric locomotives will replace approximately eighty steam engines. The variations in traffic and the shifting of motive power prevent a direct estimate of the salvage value of the latter, but an approximation based upon probable averages would indicate that this should be about 20 per cent of the total investment. Manifestly, this figure is smaller than that obtaining on the Norfolk & Western electrification because of the much lower density of traffic on the transcontinental road. In fact, the figure 20 per cent seems to represent about the minimum that might be expected under any conditions, because the St. Paul has unquestionably a lighter tonnage than any of the lines that have thus far been electrified. This road, it is true, passes over three mountain ranges within the limits of the 440-mile electric zone, and to the extent that these grades require pusher service, the number of steam locomotives needed to handle the traffic would be increased over normal conditions. However, the grades constitute one of the major reasons for introducing electric operation and on this account their influence in increasing the number of steam locomotives may be largely discounted. On the other hand, the Norfolk & Western's salvage value of 45 per cent represents presumably the maximum attainable figure.

The grades are very heavy and comprise a large percentage of the electrified line, three steam engines being used on each train prior to the advent of the electric locomotives. In addition the traffic, amounting to twenty-six east-bound trains daily, is exceptionally heavy, and these features in turn tend to offset the fact that the total cost of the installation included expenditures for a power station.

It appears, therefore, that the average salvage value of steam locomotives involved in a main-line electrification should be between 20 per cent and 45 per cent of the total cost of the installation, these figures being based on new value. In consequence, the item constitutes an important consideration in connection with calculations of possible economies due to electrification. A reduction of one-third of the investment, which is the equivalent of a salvage of $33 \frac{1}{3}$ per cent, might well be sufficient to make an otherwise apparently unprofitable installation into a very attractive proposition, and it would seem that more attention ought to be paid to this feature in connection with every preliminary calculation of electrification economics.

REGULATION MUST BE IMPARTIAL

Too much criticism of public service commissions by the public comes from the idea that the chief purpose of the commissions is to reduce rates. A case in point is the attack on L. D. Brandeis before the Senate judicial sub-committee because he, as counsel for the Interstate Commerce Commission in the 5 per cent rate case, dared to forget the "public" character of this body so far as to state that to his mind the carriers had proved their need of increased net income. We are not concerned here with the fitness of Mr. Brandeis for high judicial office, but we are interested in the assumption of certain public advocates that since the public did not favor certain rate increases, the counsel for the commission was, by virtue of this fact alone, derelict in his duty in giving an impartial ear to proof submitted by the railroads.

We had hoped that such evidences of mental bias on the question of corporate regulation were a thing of the past. In the early days of regulation, to be sure, utilities generally feared that the powers conferred upon regulatory bodies would be used primarily for the imposition of greater burdens on utilities simply in answer to public demands, and, indeed, we have often suspected that many citizens loudly supported the regulation propaganda because they had a sneaking idea that the natural result would be reduced rates and increased service. With the growth of the regulatory system and its more nearly perfected operation, however, a truer conception of the functions of commissions has generally risen, for it has been clearly realized that such bodies are not *ex parte* public tribunals sitting in judgment over utilities, but are impartial bodies pledged to restrain exorbitant and unjust public demands as much as to put wayward and recalcitrant corporations aright. While capable of a wider interpretation of their empowering acts than courts are of general statutes and constitutional provisions, commissions are real judicial

tribunals which must hold the scales of justice as level as do the courts.

The misconception of the regulatory theory that has seemed to underly the stated objection to Mr. Brandeis may not be widespread, but it is unfortunate that it should exist at all. We are glad to observe that the new commissioners in New York City, as evidenced by their recent comments in one case to the effect that the question is not how many people would like to have increased transfers but whether it would be reasonable to impose an order on the company, have the true conception of the way in which their functions should be exercised. To strengthen our point, however, we will go far away from the scene of the turmoil in New York and cite the case of the Manitoba Public Utilities Commission, whose point of view in this matter is all the more interesting because it is not presented in any particular case but is laid down in the latest annual report as a warning because of repeated public offences.

Complaints made to this commission, it is said, fall under two heads, the first covering trouble caused by the acts or neglect of individual employees. In such cases, the commission states, the public is too likely to judge a whole system by isolated acts of a small percentage of men under standard, who, even with great care in selection, will always be found where a large number are employed. Anyone who would judge fairly the operations of a utility, and more especially electric railway and telephone systems, must remember this human element. On these systems as a whole such weaknesses are no more than existing in other labor-employing undertakings, and are probably considerably less. The other class of complaints concerns demands for improvements and increased service. In the commission's opinion, such demands are often made thoughtlessly and without regard to financial possibilities or the likelihood of operating loss. There is a want of appreciation of the fact that in sparse communities reduction of rates retards new construction and service improvement, and takes away the financial basis of a commission order for such betterments. Furthermore, the commission finds that there is a tendency to look at the rate of dividend paid by electric railways and draw conclusions superficially, it being forgotten that to regulate a utility so severely as to restrict its productiveness to the current commercial rate of interest is to stifle the enterprise.

The foregoing notes from the commission's report ably prove that judicial calmness and impartiality are not at all incompatible with the exercise of the regulatory power, but to sum the matter up we shall simply quote the commission's conclusion: "These various considerations are frequently forgotten or deliberately overlooked by persons, sometimes in fact by elected representatives, who unwarrantably create discontent against what, in view of the rates and street facilities, is reasonable public service. A commission is bound to meet and deal with all these matters with a due regard to public service, but at the same time to withstand attempts to suppress a utility through the medium of the commission." Truly a Solomon sat in judgment here!

Parlor Cars to Stimulate Traffic

The Empire United Railway Has Introduced a Fast Parlor Car Service Between the Cities of Rochester and Syracuse, N. Y., Using Converted Private Cars—The Direct Revenue from This Service Approximates \$7,500 Annually

DURING the past year a fast parlor car service has been placed in operation under novel conditions by the Empire United Railways. This property includes a high-speed route between Rochester and Syracuse, N. Y., which parallels the main line of the New York Central Railroad. The steam trains make the run between the two cities in about two hours, operating a dozen trains daily in each direction, while the inter-

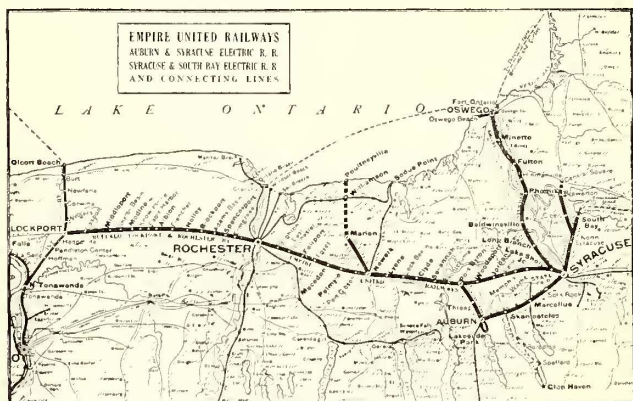
electric railway company, of two special cars which could be thus utilized to good advantage.

PRIVATE CARS CONVERTED TO PARLOR CARS

Both of these cars were typical large business cars designed for official trips over the line. They were beautifully finished inside and out and were well equipped to afford the utmost comfort in travel. Under existing conditions, however, each one represented a very considerable investment which brought no direct return, and their use for the proposed parlor car service was considered to be an excellent opportunity to place them in revenue-producing operation.

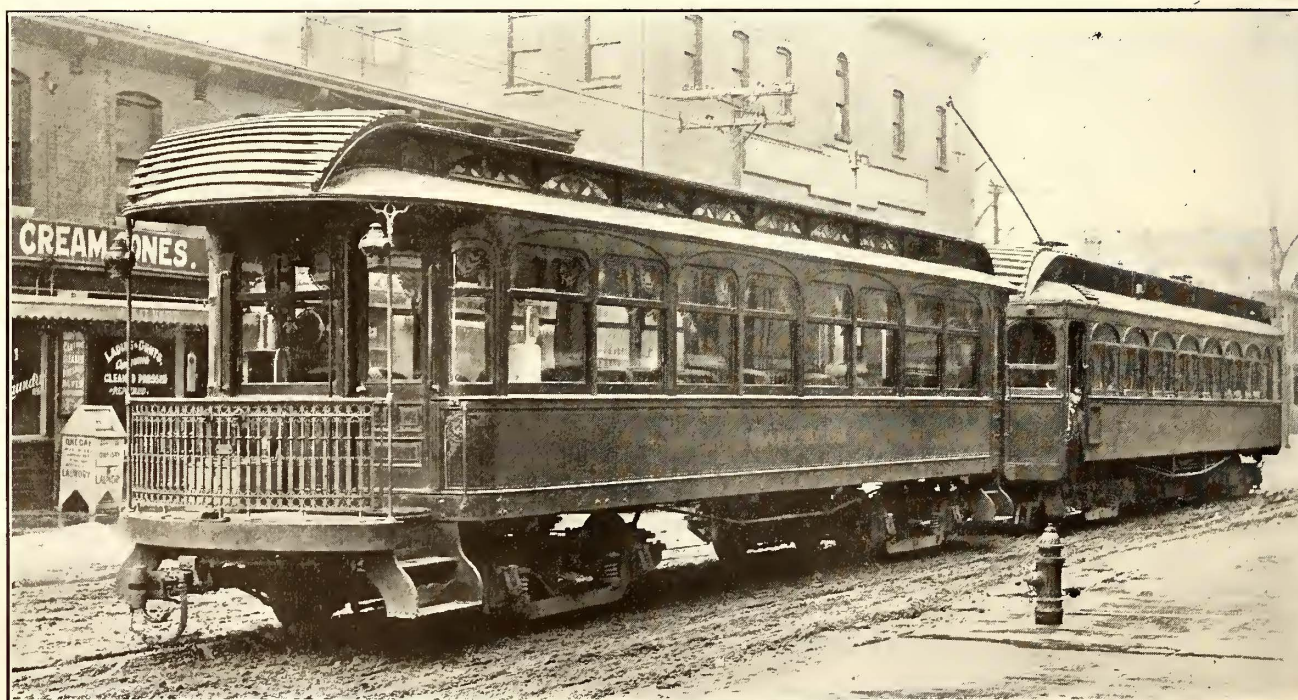
To make the cars suitable for the parlor car service, only minor changes were necessary. In general, the interior partitions which originally divided the cars into various compartments were not disturbed, but the kitchenette, stateroom and other similar arrangements with which the cars had been originally equipped were rendered superfluous by the new service and were removed. The space which they occupied was then converted into seating compartments for passengers. Large wicker chairs were installed in the body of each car, and in the section reserved for smokers leather upholstered armchairs were provided. The latter section, it may be said, is located at the front end of the car in each case, the cars being operated in one direction only, so that entrance to the main seating compartments is effected directly as passengers board the rear end of the car.

No special facilities for entrance and exit were found to be needed, owing to the relatively small number of parlor car seats that are installed, the number in one car being thirty-five and in the other car forty, and

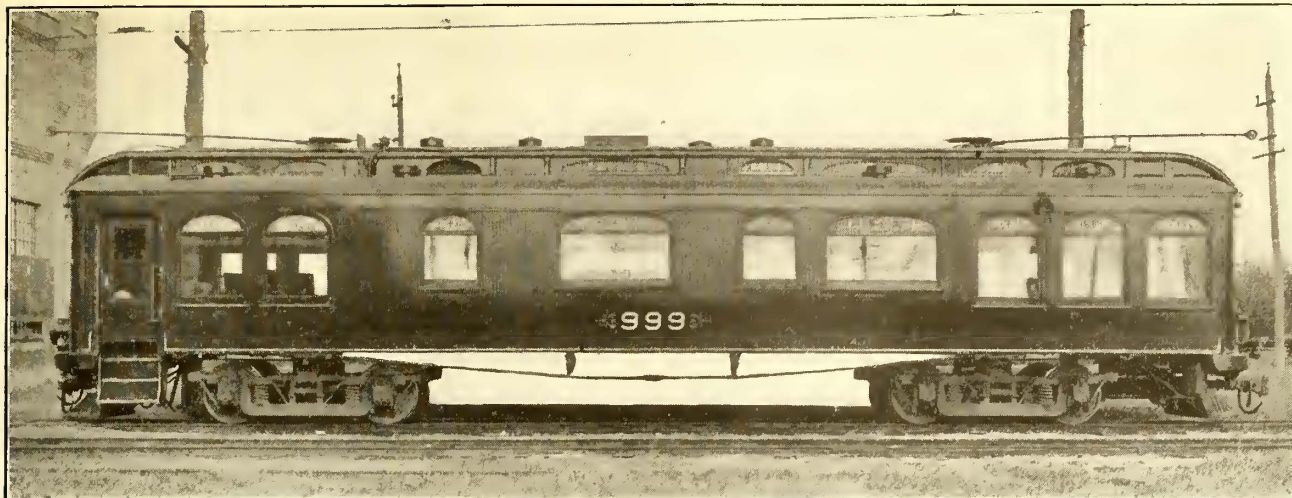


EMPIRE UNITED RAILWAY PARLOR SERVICE—MAP OF SYSTEM

urban road, with a somewhat longer route of 86 miles, makes a running time between terminals of two hours and forty minutes, including seventeen stops at various towns and villages along the line. In consequence, the competition for the through traffic is severe, and it was with the idea of attracting a greater share of this that the parlor car service was inaugurated. An important contributing circumstance was the ownership, by the



EMPIRE UNITED RAILWAY PARLOR CARS—PARLOR CAR "SYRACUSE" OPERATED AS A TRAILER



EMPIRE UNITED RAILWAY PARLOR CARS—PARLOR CAR "ROCHESTER" PRIOR TO CONVERSION

although one of the cars has no vestibule, involving four steps from the ground level to the car floor, no difficulty has been experienced on this score.

Changes in the interior equipment were minor in character. The most important was the installation of a Peter Smith coal-fired heater to save current, as power is purchased by the railway company on a straight kilowatt-hour basis from one of the Niagara power companies. These heaters have nickel-plated trimmings and a completely nickel-plated hood and blower. This makes an exceedingly fine appearance, the elaborate finish having been adopted solely for ornamental purposes, as the heaters are exposed in the interior of the main seating compartment. The lighting is of the semi-indirect type, with shaded incandescent lamps. The car floors have been left covered with soft and heavy carpet, and the highly-finished interior woodwork has been allowed also to remain, giving an exceptionally luxurious effect.

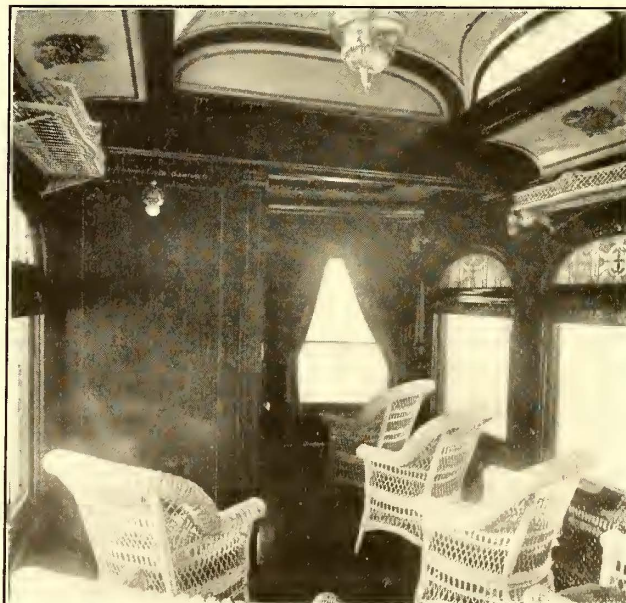
When they were converted into parlor cars, the two private cars were renamed respectively "Rochester" and "Syracuse." The former is equipped with control and motor apparatus and, in its present service, draws a trailer for a day coach. The electrical equipment consists of four Westinghouse No. 118, 125-hp. motors,

and the total weight of the car and its equipment is 90,000 lb. Originally, this car was divided into six different compartments, and when the private car equipment was being removed it was not deemed advisable to remove these partitions until the results of the new service had shown beyond any doubt that it would be permanent. In consequence, these partitions were left in place, but it is expected that in the future they will be taken out to leave only three compartments, namely, the main seating compartment, the smoking compartment and a lavatory.

The car named "Syracuse" is a trailer which weighs 50,000 lb., and this car is drawn by one of the standard passenger cars used in the interurban service of the railway company. The latter type of car weighs 87,500 lb. and is equipped with four Westinghouse No. 119, 125-hp. motors. The "Syracuse" was originally a private car having a dining-room, kitchenette and two observation compartments, but in its conversion the dining-room section was removed, leaving only a main compartment, a smoking compartment and a lavatory.

DETAILS OF THE SERVICE

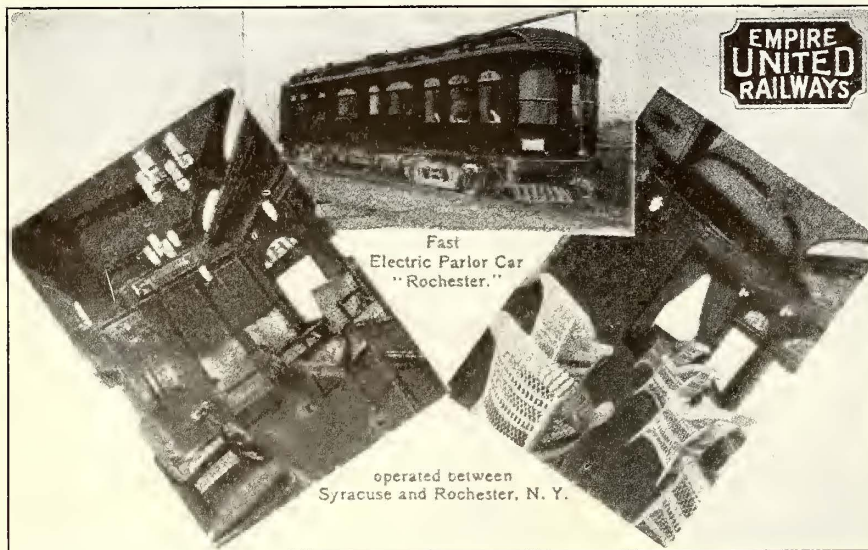
In all cases the parlor car trains consist of a motor car and trailer. No trouble has been experienced with



EMPIRE UNITED RAILWAY PARLOR SERVICE—INTERIOR VIEWS OF CARS

the equipment on the cars, and with the exception of the first week or two there has been no difficulty in making schedule time with the trailers. In the original service four parlor-car trains were operated in each direction daily, except on Sundays, cars leaving Syracuse at 7.10 a. m., 11.10 a. m., 1.10 p. m. and 5.10 p. m., and leaving Rochester at 8 a. m., 10 a. m., 2 p. m. and 4 p. m., but very recently this service has been increased as outlined in another paragraph. The actual running time for the 86 miles, as aforementioned, is two hours and forty minutes, so that westbound cars have ten minutes and eastbound cars thirty minutes lay-over. In practice it has been found that these lay-overs are ample to allow for any incidental delays that may take place. For the parlor-car trains there are seventeen intermediate stopping points, and a considerable portion of the traffic is between these towns and the larger cities. Nevertheless, a flat charge of 25 cents is made for a seat in the parlor car, regardless of the distance that is traveled.

On an average, approximately 100 passengers ride in the parlor cars each day, during the eight trips, so that the yearly receipts from the two cars is of the



EMPIRE UNITED RAILWAY PARLOR SERVICE—TYPICAL ADVERTISING POSTCARD

order of \$7,500, an attractive return in view of the fact that practically no additional investment was involved in the introduction of the service through the purchase of new cars.

However, the real reason for the installation of the new service was not so much because of the revenue obtained from the sale of parlor-car seats but rather to encourage the through travel between Rochester, Syracuse, Auburn, an important intermediate city from which connection is made to the main line between Rochester and Syracuse by means of a short branch road.

That results have justified the company's expectations in this regard is demonstrated by the fact that, although the general slump in electric railway receipts throughout the country has appeared in the form of a decrease of about 10 per cent in passenger earnings on the Empire United Railways, the through business between the cities of Rochester, Syracuse and Auburn has shown no decrease at all.

PUBLICITY FOR NEW SERVICE

Numerous ingenious schemes have been devised by the company to attract attention to the improved conditions of travel which have been brought about by the

inauguration of the parlor car service. Of these, perhaps the most novel is the operation of taxicab service to transport passengers to or from the interurban railway terminus. This plan, which is now on trial in Syracuse, was planned solely as a convenience for the patrons of the Empire United Railways, and although it is designed to be self-supporting the rates are maintained at a low figure, so that it really offers a material advantage to the railway passengers. The type of machine that is used is of the highest grade, with upholstery of mohair, making the service like that which would be afforded to the owner of a limousine rather than that expected from the ordinary taxi. The taxi service is advertised largely by distribution of small cards, bearing on one side the schedule of rates and displaying prominently the telephone number of the company's operator, to encourage the calling of the taxicab by telephone by prospective passengers.

Publicity for the parlor car service is provided also by the distribution of advertising post cards, and a typical one of these is reproduced in an accompanying illustration. In addition, attention is called to the service in the company's folders, and provision has been made for advance reservations of parlor car seats at the terminals in Rochester, Syracuse and Auburn. The hotels in the various cities along the route are furnished with framed schedules, showing the leaving time of all trains, and at the bottom special notation is made of the fact that parlor car service is afforded on certain trains. Personal solicitation by the traffic department also keeps the hotel managements active in turning business toward the electric railway.

In general, the experience with the new service, which, it should be said, was conceived by Ernest Gonzenbach, general manager Empire United Railways, has been thoroughly satisfactory in every respect. As a matter of fact the direct returns, even during the first year of operation, have been such that the company has recently reconstructed a standard passenger car, which had been built with a somewhat more elaborate finish than usual, into a parlor car similar in character to the two which were originally placed in operation.

This car was placed in regular service on Feb. 3 to amplify the original parlor car schedule, and it enables the company to provide a two-hour parlor service out of Syracuse and Rochester during the entire day. The first parlor car now leaves Syracuse at 7.10 a. m. and the last one at 5.10 p. m., while from Rochester the service begins at 8 o'clock in the morning and ends at 6 o'clock in the afternoon.

To supply energy to the last electrified section of the Lancashire & Yorkshire Railway, from Manchester to Bury, via Heaton Park and for future lines, which has recently been electrified, a power station has been built a few miles out of Manchester. The generators consist of two 5000-kw. 6600-volt turbo-alternators, made by Dick, Kerr & Company, which are supplying three-phase current to two substations, Victoria Station, Manchester and at Radcliffe, also a third turbine unit, consisting of a 500-kw., three-phase, 25-cycle Westinghouse geared turbine set to generate current at 440 volts for auxiliary uses.

Three-Wire System in Los Angeles

This Installation Has Been in Use for More Than a Year on 125 Miles of Track, and Important Reductions in Track Voltage Have Been Obtained—Advantages and Disadvantages Discussed

By S. H. ANDERSON

Electrical Superintendent Pacific Electric Railway

At the present time the Pacific Electric Railway has the three-wire system of distribution in use on 125 miles of track. On a part of this track the system has been in use now for more than a year, so that the company has had an opportunity to study the efficiency of the system as a means of reducing the voltage gradients in the track and thereby improving the electrolysis conditions in the adjacent territory.

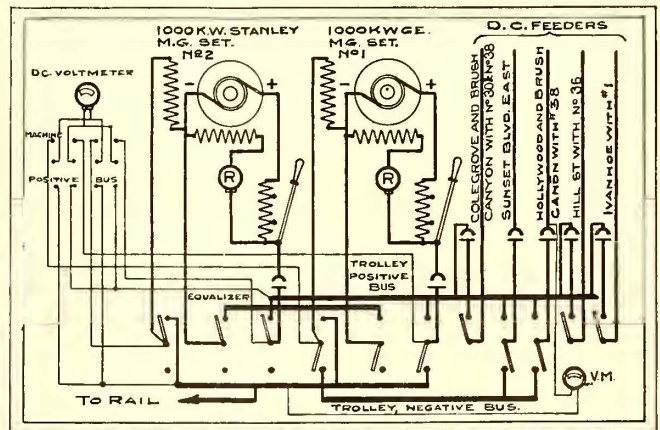
The trolley is broken up into insulated sections alternately positive and negative to the rails. The motor generator sets in the substations are run two in series, the neutral between the two motor-generator sets being connected to the rails and the positive and negative terminals being connected to the corresponding sections of the trolley. There are four of the Pacific Electric Railway Company's substations so arranged, and all of the trolley fed from these stations is operated on the three-wire system. The names and locations of these substations and the equipment in them is as follows:

Name	Location	Equipment
Olive	Los Angeles	two 1000-kw. motor generators
Sherman	Sherman	one 1000-kw. motor generator
Pasadena	Pasadena	one 400-kw. motor generator
Pasadena	Pasadena	two 1000-kw. motor generators
Altadena	Altadena	two 600-kw. motor generators
Altadena	Altadena	two 200-kw. motor generators
Altadena	Altadena	one 400-kw. motor generator

Total capacity of motor-generator, six sets.....7,400 kw.

The upper diagram shows the connections for the Olive substation, and the second diagram the arrangement of feeders and trolleys supplied from this substation and the Sherman substation. The territory between these substations consists largely of a high-class residential district called Hollywood. The largest part of the traffic over the company's lines in this district is local, but includes also interurban service to the San Fernando Valley and to beach resorts.

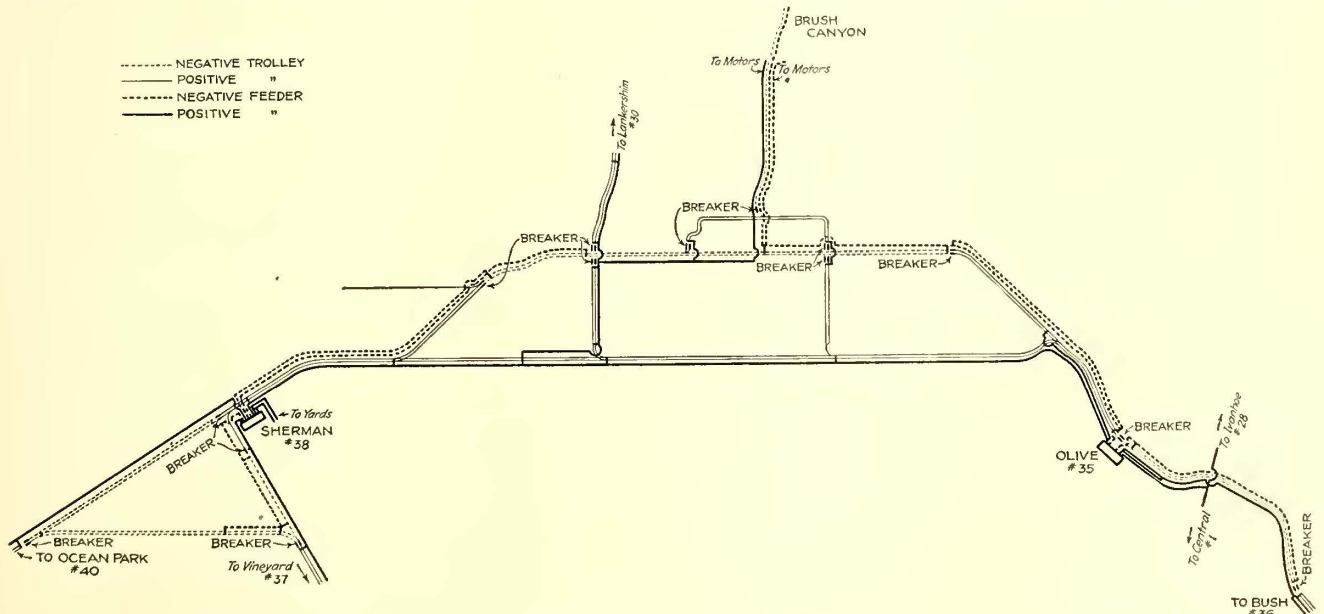
The introduction of the three-wire system did not require any very extensive changes in substations and feeders. At Olive substation it involved nothing but a few changes in switchboard connections. At Sherman substation it involved changes in switchboard connections and the installation of a 400-kw. motor-generator set. No additional feeders were required, but the old feeding system was rearranged somewhat and sectional insulators installed in the trolley wire. Between the



THREE-WIRE SYSTEM—CONNECTIONS ON BACK OF SWITCHBOARD, OLIVE SUBSTATION

positive and negative sections of the trolley two standard 600-volt sectional insulators were used, spaced 6 ft. apart.

When the system was laid out an effort was made to divide the positive and negative sections so that the average over-all voltage from the substations to a point on the track midway between the substations would be



THREE-WIRE SYSTEM—DIAGRAM SHOWING POSITIVE AND NEGATIVE TROLLEYS AND FEEDERS

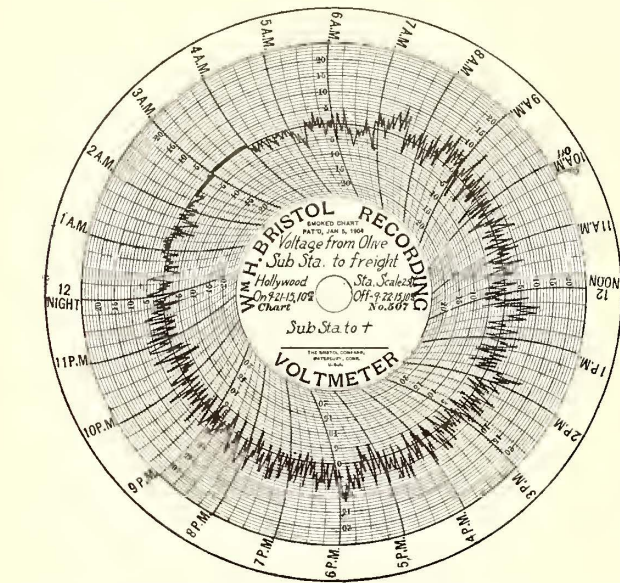
approximately zero. After the system was placed in operation it was found necessary to shift the location of one set of sectional insulators slightly to secure this result. At Brush Canyon there are a number of motors operating a stone quarry and connected between trolley and rails. These motors take about 400 amp., which was formerly all returned through the rails to Olive and

arrangement is similar to that at Olive and Sherman. At neither Pasadena nor Altadena substations was it necessary to install any additional equipment in order to make use of the three-wire system.

RESULTS SECURED BY THE USE OF THE THREE-WIRE SYSTEM

The large chart on this page shows the voltage conditions which obtained in the track between Olive and Sherman substations before and after the use of the three-wire system. It will be seen that with the use of this system the track voltage has been very greatly reduced. There are still voltage swings in the track of considerable magnitude, but they reverse rapidly in direction and the algebraic average voltage is everywhere very low. For example: the voltmeter chart reproduced on this page shows a continuous twenty-four-hour record of the voltage in the track between Olive substation and the freight station near Ivar Street on Hollywood Boulevard, a distance of 3 miles. Ivar Street is positive to Olive substation a maximum of 14 volts and is negative to Olive substation a maximum of 9 volts, Ivar Street being positive to Olive substation an algebraic average for twenty-four hours of only 0.7 of a volt. Electrolytic action on underground pipes is proportional, other things being equal, to the average voltage drop in the rails rather than to the maximum voltage drop, so that it will be seen that such action in this case has been reduced to a very small amount. Previous to the use of the three-wire system, Ivar Street was positive to Olive substation 25 volts maximum and 18 volts average for one hour, no twenty-four-hour record having been taken.

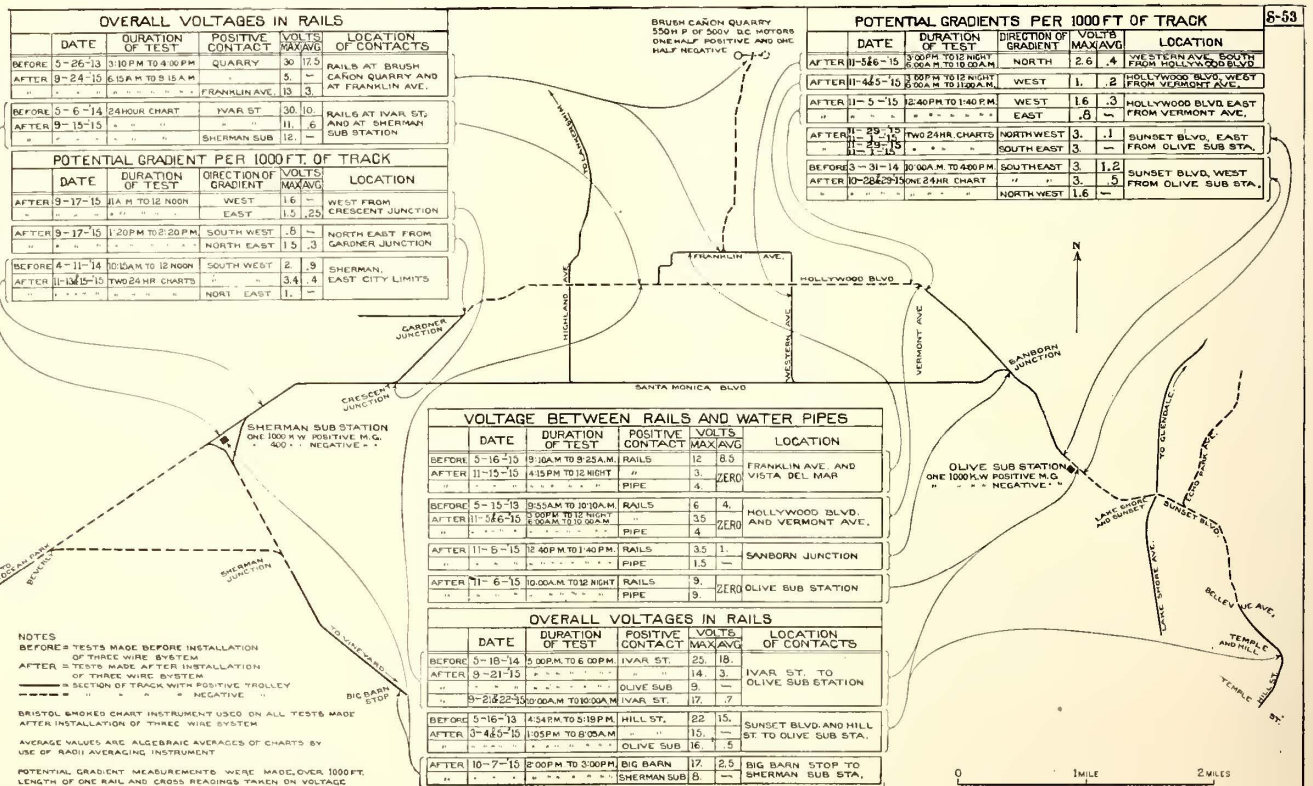
In the chart below showing voltages before and after the change was made, the points for measurement selected are those where the maximum gradients were found. It would be an easy matter to reduce them still further by shifting the sectional insulators, but it would be at the expense of the over-all voltage and was not considered desirable.



THREE-WIRE SYSTEM—VOLT-METER CHART FOR TWENTY-FOUR HOURS BETWEEN TRACK AT HOLLYWOOD FREIGHT STATION AND NEUTRAL BUS AT OLIVE SUBSTATION

Sherman substations. When the three-wire system was put in effect, one-half of these motors were put on a positive feeder and one-half on a negative feeder so that this load was almost entirely removed from the rails.

At Pasadena and Altadena substations the general



THREE-WIRE SYSTEM—DIAGRAM SHOWING VOLTAGE CONDITIONS AT POINTS OF MAXIMUM DIFFERENCE OF VOLTAGE BEFORE AND AFTER INSTALLATION OF THREE-WIRE SYSTEM

Results secured in Pasadena and Altadena are similar to those secured in Hollywood.

DISADVANTAGES OF THE THREE-WIRE SYSTEM

The chief disadvantage in the use of the three-wire system lies in the fact that the load factor on the individual units in the substations is reduced somewhat and the substation losses thereby increased. Also, the losses in the trolley feeders are increased slightly. Under some conditions this would be serious. Under the conditions obtaining on the Pacific Electric Railway, where the three-wire system is used, these losses have been largely compensated for by the reduction in the power loss in the track.

Among minor points, the fact might be mentioned that luminous arc headlights on the cars will not burn satisfactorily when the current is reversed through them. On the Pacific Electric Railway, incandescent headlights and carbon arc headlights are used where the three-wire system is in operation and are satisfactory. Where cars are equipped with storage batteries for operating the control equipment and where the batteries are charged from the trolley while cars are in service, it would in some cases be necessary to install polarized relays in the charging circuits to prevent reversal of current through the batteries. This has not been necessary on the Pacific Electric Railway on account of the short distance which such cars operate over negative trolley.

There have been no serious operating difficulties encountered where the three-wire system has been used on the Pacific Electric Railway either in the substations, on the lines or on the cars.

COMPARISON OF THE THREE-WIRE SYSTEM AND INSULATED NEGATIVE FEEDER SYSTEM

Under favorable conditions, such as exist where there are a sufficient number of units in the substations and a sufficient number of feeders to carry out a three-wire system of distribution, such a system can be installed at a small fraction of the cost of an insulated negative feeder system, and it can be operated with much less loss than that incident to the use of an insulated feeder system of equal effectiveness.

There is nothing that can be accomplished in the matter of electrolysis mitigation by the use of an insulated negative feeder system which cannot also be accomplished by a three-wire system of distribution.

Cost of Power Plant Chimneys

Among the data filed by the Bay State Street Railway with the Massachusetts Public Service Commission in the pending fare case were the detailed costs of power plant equipment. Some details of the chimneys of these plants are given below, together with their costs, including 14½ per cent for engineering, interest, insurance, contingencies, taxes and organization.

Haverhill Plant: Circular brick stack; 137 ft. high; inside diameter at top 6 ft.; built in 1892; cost \$6,195.

Byfield Plant: Circular brick stack; 80 ft. high; inside diameter at top 5 ft.; built in 1899; cost \$3,463.

Chelsea Plant: Circular brick stack, supported by granite foundation on piles; height 152 ft.; inside diameter at top 8 ft.; built in 1891; cost \$9,365.

Essex Plant: Square brick chimney, supported by granite foundation; 70 ft. high; inside diameter at top 5 ft.; built in 1895; cost \$2,444.

Lawrence Plant: Custodis brick stack; built in 1910; 150 ft. high; inside diameter 8 ft.; cost \$5,594.

Lowell Plant: Brick chimney, supported on concrete base resting on 40-ft. piles; built in 1890; 195 ft. high; inside diameter at top 9 ft. 8 in.; cost \$16,507.

Salem Plant: Circular brick stack on granite foundation with timber piles; height, 158 ft.; inside diameter at top 8 ft.; built in 1893; cost \$12,216.

East Woburn Plant: Custodis stack; 175 ft. high; inside diameter at top 9 ft.; built in 1912; cost \$6,903.

Quincy Point Plant: Two radial brick stacks of the Custodis type; 125 ft. high; pile and concrete foundations; built in 1903; each stack cost \$12,252.

New Form of Voucher Check

After Six Months' Trial the Connecticut Company Testifies to Time-Saving and Economy of Device Shown Below

THE Connecticut Company, New Haven, Conn., recently devised and put into use a new form of voucher check in which electric railway accountants will undoubtedly be much interested. The front of this voucher check is shown in the accompanying illustration, the back of it containing only the name of the company and spaces for the voucher number and the month. The voucher is prepared in the auditing department on a typewriting machine. The distribution is shown on the face of the voucher, which enables the items to expenses, etc., to be passed directly to the books without turning over papers. The check portion is written in favor of

007 THE CONNECTICUT COMPANY					Audit No. -- 494
Check No. 6	NEW HAVEN, CONN.			Month of	
To	Address			Treas. No.	
In payment of				Month of	
Chargable to General Ledger Account		Sub. Account Numbers	Division	Amount	Total
Prepared by	Correct	Correct	Approved	Approved	Approved
Checked with Summary	Distribution Checked	Correct	Approved	Approved (Head of Dept.)	Approved for payment
					President
					Comptroller
Check No. 6	THE CONNECTICUT COMPANY			Audit No.	
TREASURER'S OFFICE, NEW HAVEN, CONN.			Treas. No.		
Pay to the order of _____ \$ _____ Dollars					
Countersigned _____			President	Treasurer	
Endorsement by payee is receipt, in payment of _____					

VOUCHER CHECK—SHOWING NEW FORM RECENTLY ADOPTED BY THE CONNECTICUT COMPANY

the payee when the voucher is prepared, thus saving the treasury department a great deal of work. The treasurer's office has merely to date the check, stamp the name of the bank where it is payable and sign it. The president's approval appears on the check as a countersignature, which has the advantage of both approving the payment and countersigning the check. The approval of the auditor or comptroller appears on the voucher, and then, if necessary, on the check as a countersignature. I. A. May, comptroller of the company, states that the new form has been in use for about six months and has demonstrated that it is a time-saver and therefore an economical device to use.

Accident Reduction in Chicago

The Elevated Railroads of Chicago Received "Honorable Mention" from the American Museum of Safety Committee on Award of the Brady Medal—A Summary of the Accident Prevention Work of This System Is Given Below

THE efforts of the Elevated Railroads of Chicago in the direction of accident prevention have been chronicled from time to time in the columns of the *ELECTRIC RAILWAY JOURNAL*, the latest extended account appearing in the issue for Aug. 21, 1915. This article was reprinted in the September issue of the *Elevated News*, a publication of the Elevated Railroads issued under the editorial direction of H. A. Johnson, master mechanic. The following statement of some recent safety work done was in part the basis on which the award was made.

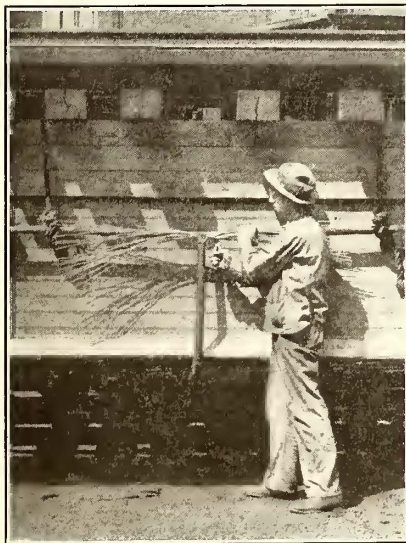
FACTS ABOUT THE ELEVATED RAILROADS

These railroads operate approximately 69 miles of road, including 54 miles of two-track, 8 miles of three-track and 7 miles of four-track road. They serve the greater part of Chicago and the adjoining towns of Evanston, Wilmette, Oak Park, Forest Park, River

In 1914 the central committee began the publication of the *Safety Bulletin*, a four-page paper which is the official organ of all welfare work. In November, 1914, a safety engineer was appointed to devote all of his time to this work and he, with the electrical engineer and the medical examiner, assumed the work of the central committee which was then named the "Employees and Safety Committee."

A "Watch Your Step" crusade resulted in firmly establishing this phrase in the public mind and this was followed by effectively advertising "safety first" with catchy explanatory sentences. The staff photographer made photographs to illustrate incorrect and correct procedure from the accident reduction point of view. These were reproduced on lantern slides and used effectively at employees' meetings. Several of these scenes are reproduced herewith.

While the accident problems are different in a sys-



SAFETY ON THE CHICAGO ELEVATED—PROTECTION IN CABLE SPlicing; PROTECTION IN TRACK WORK; CANVAS PROTECTION IN THIRD-RAIL WORK

Forest, Hawthorne and Clyde, which had a combined population of 2,300,000 according to the 1910 census. There are five divisions of which the Union Loop is the central one, the others being spread out in fan form. The loop district traffic is greatly congested. Travel is mostly of the long-haul variety, the surface lines taking care of the shorter runs. All of the lines but the outlying portions are on elevated structure.

THE SAFETY MOVEMENT

The Metropolitan division began the safety work in 1910 by the appointment of a committee which made inspections of the property and reported on possible improvements to reduce accidents. After the consolidation of the elevated roads in 1911 safety committees were appointed in four divisions, each consisting of the division general foremen of the way and shop departments, the division supervisor of service and a representative of the claim department. These report to a central safety committee.

tem operating largely elevated track from those of surface lines, these problems are nevertheless present, as is illustrated by the following analysis of the 1914-1915 record. During this year 15,700,000 train-miles and 49,300,000 car-miles were run with the loss of eleven lives and 584 other casualties. None of the fatal accidents were train or shop accidents. Three persons, two of them intoxicated, fell from platforms in front of trains, one employee was shot in a hold-up, a fifth person dodged under a closed gate on a grade crossing in spite of the flagman's efforts to stop him and stepped in front of a train, while the remaining six persons were trespassing when struck by trains.

An analysis of the injuries to passengers in other than train accidents shows that 82 per cent of them result from the following causes: (1) Falling on station stairs or platforms; (2) falling in cars or on or between car platforms; (3) falling between car and station platforms, and (4) air-door and gate accidents. Efforts are being made to reduce these accidents by get-

ting at the causes. Better lighting is being introduced to reduce the first class of accidents, and stair treads covered with gravel roofing paper and edged with alundum nosings have been introduced. In winter the stairs are kept clear of ice and well sanded. Accidents on cars, being largely due to the presence of bulky packages in aisles and to irregularities in controller operation, are being reduced by prohibiting the former and keeping the equipment and operating discipline at a high standard. As considerable clearance is necessary between the edges of station and car platforms constant admonitions to "watch your step" have been used with good effect and the clearance spaces are brightly lighted. The reduction of gate and door accidents is partly a matter of discipline and partly of education of passengers. When necessary, extra platform men have been provided to assist in loading and unloading trains.

OTHER EFFORTS TO REDUCE ACCIDENTS

During the year ended June 30, 1915, many special devices were installed to reduce accidents and the use of other equipment was extended. Only a few of these will be mentioned.

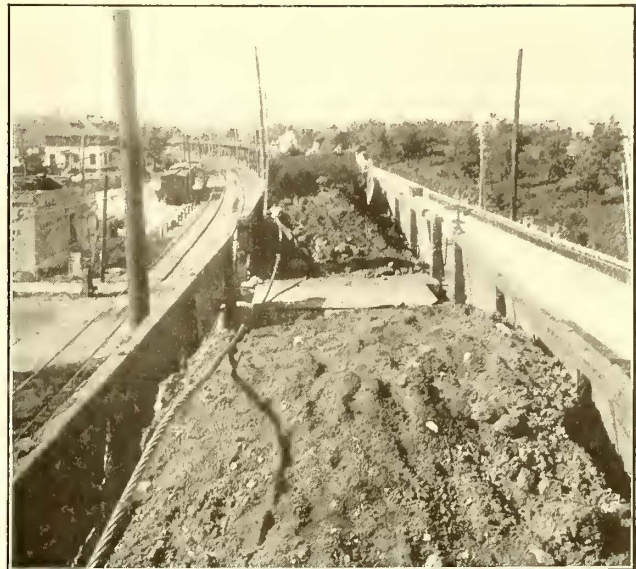
At one junction a detector route locking scheme was applied, by which the track signal circuits were so connected that when one of two diverging routes is set up, the other cannot be cleared until a train has taken the first. It can only be unlocked by the towerman going to the bottom of the tower, breaking the glass cover of a box and pushing the button therein.

Arc lamps at grade crossings have been replaced with high-wattage tungsten lamps to improve the illumination. Gates have been painted in brilliant red and white, while enameled steel signs, always vertical, have been hung from the arm ends.

By the elevation of 4 miles of track on the Evanston-Northwestern division, thirty-three grade crossings, with their attendant dangers have been eliminated.

To prevent pedestrians from dodging under gates at grade crossings simple aprons, consisting of wood or metal strips suspended parallel to the gates, were installed on street and sidewalk gates.

Wherever large bodies of men are working on the tracks which are in use, in addition to the flagmen stationed to protect them a portable automatic trip is placed on the track at a considerable distance from the men. This is normally in the "danger" or trip position



SAFETY ON THE CHICAGO ELEVATED—WORK ON THE EVANSTON TRACK ELEVATION

and can be cleared and held clear only by means of a rope manipulated by the flagman.

In the shops among the improvements introduced last year were the following:

Low bridge warning guards on roof trusses, a railing along the crane walk and a hand rail on the crane were installed for the protection of the crane operator.

Set screws and other projections on line shafting were removed.

A guard cable was installed in the shop to prevent the trolley traveler from falling if derailed.

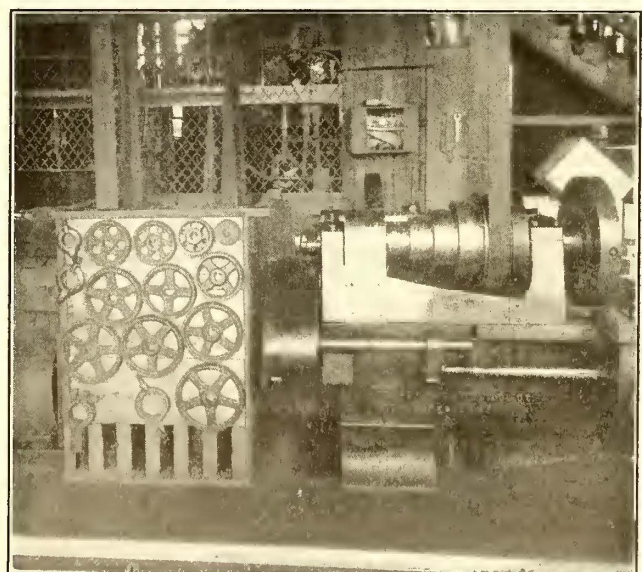
Hydraulographs were placed on all wheel presses to check press fits of wheels and gears.

On the cars the fire extinguisher equipment was extended, safety suspensions and stronger gear case supports were put on a number of cars, obsolete brake valves were exchanged for modern ones, many truck brake beams were replaced with heavier ones, safety stops were added to toggle-bars, truss-rods and car gates, etc.

On the roadway it was found that, during repairs, material falling from the elevated structure caused a number of accidents to persons passing below. This



SAFETY ON THE CHICAGO ELEVATED—GUARD ON CIRCULAR SAW



SAFETY ON THE CHICAGO ELEVATED—GEAR GUARDS ON LATHE

source of accident was practically eliminated by the use of canvas sheets hung below the site of the work, or where this did not suffice the ground below was inclosed by red fences and patrolled by watchmen.

Special red guard boxes have been provided to cover the conductor rails when workmen are employed near them, as illustrated in an accompanying halftone.

Extra 10-in. x 10-in. iron-faced guard rails are being installed on the elevated structure as a safety precaution. To date these have been placed on sharp curves and bridges only.

PHYSICAL AND MENTAL STANDARDS OF EMPLOYMENT, AND DISCIPLINE

An important element of the safety work of the Elevated Railroads is the examination and training of employees. The methods used in the medical department were fully explained by Dr. H. E. Fisher, the company surgeon, in an article printed in the issue of the *ELECTRIC RAILWAY JOURNAL* for Aug. 7, 1915, page 216. An article on first-aid methods followed in the issue for Sept. 11, page 430.

The central safety committee has compiled a set of safety rules which are contained in a booklet of which a numbered copy is loaned to each employee. Persons in charge of work are required to see that these rules are understood.

During the past year the "honor system" of administering all rules has been applied in place of punishment for infraction thereof, and excellent results have been secured.

EDUCATIONAL SAFETY WORK

During the year covered by this summary, the safety engineer gave a number of illustrated lectures before schools, improvement clubs, etc. These have been supplemented by lectures by the medical examiner, all going to show how the public can reduce the number of accidents. Thousands of letters have been sent to school teachers asking co-operation in eliminating stone throwing by pupils.

The employees have been instructed through every possible channel and a suggestion contest, with a substantial prize, was inaugurated last spring.

In conclusion it may be stated that the chief operating difficulties of this system are imposed by the Loop Division. The loop consists of 2 miles of double track on which are eleven stations. Fifty per cent of all revenue traffic is carried to and from this area of 1½ square miles. At times 190 trains comprising 925 cars enter it hourly, on an average of a train of 4.9 cars on each track every thirty-eight seconds. During the year the track elevation under traffic, described above, also introduced dangers. In spite of all this, however, the safety record was excellent, the company being a close second in the competition for the Anthony N. Brady medal.

Ten Difficulties of Regulation

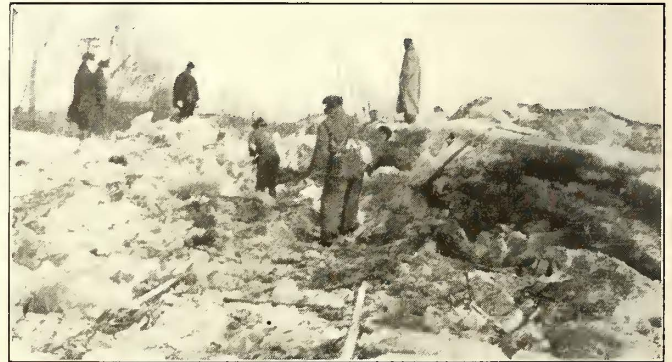
Ten difficulties of state regulation of public utilities were named by H. O. Garman, chief engineer Indiana Public Service Commission, at a recent joint meeting of the Indiana Engineering Society and the Indiana Sanitary & Water Supply Association. They are as follows: Resentment on the part of the municipalities toward state interference; change of personnel of commission after the members have been educated to their duties by experience at the expense of the public; lack of continuity of policy owing to changes in organization; attempts at political advertisement on the part of some city officials by starting trouble where no real trouble exists; lack of some

form of civil service restriction for the protection of the commission in obtaining its employees; lack of a co-operative spirit; political ambitions of commissioners; lack of publicity of the right sort concerning the activities of the commission; lack of confidence in the commission, and lack of funds to carry on the work properly.

Ice Gorges Damage Illinois Valley Line

Floods Disable Two Plants of the Northern Illinois Traction Company Resulting in Temporary Stoppage of Service

UNPRECEDENTED floods in the valley of the Illinois River and its tributaries, due to the combination of a warm rainfall, melting snow and ice gorges, seriously damaged and put out of service several sections of the Chicago, Ottawa & Peoria Railway Company's line between Marseilles and Peru, Ill. The flood reached its crest on Jan. 21, but subsequent ice gorges maintained the river at a high stage, making it impossible to repair certain damaged sections up to as late a date as Feb. 12. The water in the Illinois River backed up until it was 10 ft. above the crest of the Marseilles dam, which supplies water to the hydroelectric plant of the Northern Illinois Light & Traction Company, also at Marseilles. Although the level of the flood at this stage was 17 in. above the generator room floor, damage to the electrical equipment was slight,



CLEARING ICE FLOODS FROM INTERURBAN TRACKS ON THE CHICAGO, OTTAWA & PEORIA RAILWAY SYSTEM

consisting largely of water-soaked insulation. The plant was out of service from the afternoon of Jan. 21 until the morning of Jan. 23. The steam plant of this company at La Salle, Ill., was also out of service from Jan. 21 until the evening of Jan. 24.

Damage to the lines of the railway company, aside from interrupted energy supply, consisted chiefly of flooded and ice-gorged tracks where the overhead lines were literally mowed down. As shown in the accompanying illustration, the ice was piled up from 6 ft. to 8 ft. high over the tracks at some points, and two bridges were carried away when the gorge broke. As soon as the Illinois River receded, men were put to work clearing the track. At one point it was covered with ice for ¼ mile. Axes, ice tongs and shovels were used to cut a roadway through the piles of ice. West of Ottawa about 3 miles of track were also covered with water and ice, and the pole lines destroyed. At a number of other points along the line, which follows the Illinois River valley for practically its entire length, the tracks were flooded and the pole lines cut down. While the actual damage to physical property amounted to not more than \$25,000, the loss of three days' operation added materially to this amount.

C. E. R. A. Holds Annual Meeting

Utility Regulation as Seen by the City Manager and the Public Utility Commission, and Steam Railroad Electrification Were the Central Themes of Thursday's Papers at the Dayton Meeting

MORE than 220 members and guests attended the annual meeting of the Central Electric Railway Association, held at the Miami Hotel, Dayton, Ohio, on Feb. 24 and 25. Charles L. Henry, president of the association, presided over the sessions. On Thursday evening the first annual banquet of the association was held, with an attendance of 237 persons. Special cars to the Dayton meeting were run by the Terre Haute, Indianapolis & Eastern Traction Company from Indianapolis, Ind., by the Fort Wayne & Northern Indiana Traction Company from Fort Wayne, Ind., by the Michigan Railways from Jackson, Mich., by the Cleveland, Southwestern & Columbus Railway from Cleveland, Ohio, and by the Toledo Railways & Light Company from Toledo, Ohio.

THURSDAY MORNING SESSION

The Thursday morning session was opened with the annual address of the president, followed by the annual report of the Central Electric Traffic Association by A. L. Neereamer, chairman, and the annual report of the Central Electric Railway Accountants' Association, by F. T. Loftus, president. H. M. Waite, city manager of Dayton then addressed the association. L. C. Bradley, assistant district manager Stone and Webster, Houston, Tex., who was on the program for an address, was unavoidably prevented from being present at this meeting. Secretary Neereamer then read the minutes of the last meeting and reported sixteen new applications for membership.

Following the adjournment five special cars, furnished through the courtesy of the People's Railway, transported the entire party to the plant of the Ohmer Fare Register Company. At this point luncheon was served in the company's assembly room, following which Col. Robert Hubler introduced J. F. Ohmer who addressed the association. After outlining the advantages of Dayton and its form of government, Mr. Ohmer called attention to the employees' welfare work of his organization. Suggestions are solicited from all employees and remarkable results have been obtained. Mr. Ohmer mentioned instances where the cost to manufacture certain parts of his registers had been greatly reduced. In one instance the cost was reduced from \$5.40 to \$1.16, and in another from \$80 to \$30. Twice a year the company offers cash prizes for the best suggestions. The company also gives an annual picnic for its employees and their families. It bears the entire expense and at the same time does not deduct from the wages of the employees payment for the time spent at these picnics. The work is much appreciated by the employees.

Mr. Ohmer believed that employees' welfare work of the character illustrated in his plant should be applied to all railway organizations. He believed that the men in the ranks and not those in the official positions were best fitted to offer suggestions for the advancement of the industry. Mr. Ohmer also called attention to the slogans posted about his shop and apropos of these suggested that the conductors of all railways should have signs containing their names which could be inserted in racks where they could be seen by every one on the cars.

Such signs would increase the public's respect for the conductors and at the same time impress them with the responsibility of their tasks.

President Henry commended Mr. Ohmer for his excellent suggestions and extended to him the thanks of the association for his hospitality. Following an inspection of the various departments of the fare register plant the party returned to the Miami Hotel where the association program was continued.

THURSDAY AFTERNOON SESSION

Hon. Beecher W. Waltermire, chairman of the Public Utilities Commission of Ohio, the first speaker at the afternoon session, discussed the function of the public utility commission. After calling attention to the wonderful progress made in the past fifty years, he said that these rapid strides had created new problems. He cited the instance of the candle of the past which could be bought anywhere and of which the price was governed by the laws of supply and demand. To-day the public utility furnishes that service and it is owned and operated as one company. If this utility was unregulated it could fix the quality of service and the charge for it. The same condition, he said, was also true of heat, means of communication and transportation.

Mr. Waltermire averred that some individuals contended that if they made great inventions these belonged to them to use as they pleased. He said that such a condition existed only so long as the invention was not given to the public. So it was with any service upon which the public was dependent, and this gave rise to the need for regulatory commissions. States have prescribed means of regulating these utilities but it was never intended that these means should be used to the disadvantage of the public utilities. There are certain rights which the public is justified in asserting and in turn there are certain rights which the utility can properly assert. The utility has a right to manage its property and to fix a charge for its service that will pay a fair return on the investment in the property. In maintaining a balance between these rights the function of the commission is simply that of an unbiased umpire.

Instead of creating discord a commission should bring about harmony. There was no more reason why a public should quarrel with its utility than that it should quarrel with its merchants. There cannot be progress without them, and the utilities, on the other hand, cannot prosper without the public. Differences between the public and the utilities arise from two principal causes. Either the utility is made the football of politics or it is selfish in its dealings with the public. With the advent of the utility commissions the frequency of these controversies is declining.

Mr. Waltermire emphasized the economic side of the problem by stating the laws which governed the economics of public utilities were just as fixed as any others. The pendulum swings both ways. If the public demands too much, capital becomes timid, and if the utility is arbitrary it loses business. The equitable solution of the problems confronting utility commissions is only possible by approaching them with an open mind. The commission is in a position to render this service

and also eliminates the delays incident to action in the courts.

In closing Mr. Waltermire said that many of the difficulties affecting public utilities were due to a lack of information. The mass of men are honest and if they know what is right they will decide justly. He believed that the reports to the commissions were in a way reports to the public and tended to bring about a better understanding.

I. W. Hershey, engineer Westinghouse Electric & Manufacturing Company, then read a paper on the electrification of the Norfolk & Western Railroad, a portion of the paper being illustrated with lantern slides. An abstract of the paper will appear in next week's issue.

REPORT OF SECRETARY-TREASURER

A. L. Neereamer, secretary-treasurer of the Central Electric Railway Association, presented at the meeting his report for the year ended Dec. 31, 1915. The cash on hand on Jan. 1, 1915, amounted to \$2,802, and the receipts during the year raised the total to \$9,538. After the payment of expenses there remained at the end of the year \$979 of cash on deposit and \$2,126 of investments. This latter amount covers twenty shares of 6 per cent stock of the Railroadmen's Building & Savings Association, amounting to \$2,000, and a running account on five shares on which has been paid \$126. Of the expenditures for stationery and printing, \$1,086 was for the printing of tariffs, for which there was received \$1,122, leaving a surplus from tariffs of \$36. Besides the investments and cash on deposit, there was on Dec. 31, 1915, an amount of \$112 due from members, so that the total assets of the association on this date were \$3,217, with no liabilities. Mr. Neereamer said that the finances were now in the best condition since the organization of the association.

REPORT OF ACCOUNTANTS' ASSOCIATION

For the C. E. R. A. Accountants' Association F. T. Loftus, president, reported on the progress made during 1915. Among other things mentioned Mr. Loftus said that the book of proceedings was revised in January, 1915, for the year 1914, and a copy was sent to each member. The by-laws were amended to permit the secretary of the Central Electric Railway Association to be elected secretary of the Accountants' Association. They already have the same treasurer. The recommendations of the association regarding the handling of passenger and freight accounts were revised and enlarged to cover developments. The book of accounting forms was discontinued and a system of indexed filing pockets installed in its stead in order to allow an expansion, to reduce the labor of filing and to reduce the expense of shipping, when supplying members with samples of forms requested. A copy of the index to the accounting forms file was supplied to each member. Mr. Loftus suggested that other departments take advantage of the system of report-form filing and said that if forms were forwarded to the secretary and marked so as to show the department using them and the manner of use, the association would gladly donate its services in filing and indexing the forms presented.

In addition to describing the work of the association for 1915, Mr. Loftus gave a general review of its activities since its formation. He then referred to the electric railways which had entered, or were considering entering, the electric light and power field and said that already many questions had been presented as to the handling of the accounting work. To meet this demand, the committee on electric light and power accounting was formed and will endeavor to present a

comprehensive system for a small business of this nature at the meeting in June, 1916.

Mr. Loftus said that one stumbling block which had stood in the way of the uniform accounting plans of the association had been its inability to enforce its plan for settlement of monthly traffic balances by bank draft. In 1910 much time and correspondence were spent in endeavoring to line up all members to the use of this method, but although most of the larger and medium sized companies had adopted it, many continued to use one or the other of four different plans. As the settlement by bank draft is by far the easiest and most satisfactory method and is in use by the majority, the association feels that if the matter were thoroughly investigated by the executive officials of the roads at fault, all would at once enter into its use and the uniformity so greatly desired in interline accounting would be secured.

REPORT OF TRAFFIC ASSOCIATION

As chairman of the Central Electric Traffic Association, Mr. Neereamer submitted a report of the work done during 1915. He gave many of the statistics presented by him at the annual meeting of the Traffic Association, published on page 210 of the issue of this paper for Jan. 29, and in conclusion referred to the plan of establishing a basis for uniform class rates, on which a committee has been working for more than two years; also to the revision being made of the exceptions to the official classification in order to comply with the decisions of the various commissions and courts. In conclusion he referred to the "intangible benefits" derived by the member companies and said that during 1915 these had been more apparent than ever before.

Annual Address of President

Charles L. Henry Discusses Progress and Needs of the Central Electric Railway Association and of the Industry at Large

AT the opening of his address President Henry referred to the flood in Dayton in 1913 and to the wonderful recuperative powers shown by the city. He then spoke of the increase in membership of the association during the past year. A year ago it represented 4166 miles of interurban railway, but this total had now grown to 4838 miles. The Detroit United, which was a member a year ago to the extent of 56 miles of its track, had now brought in its entire interurban system, an aggregate of 421 miles; the Michigan United with 377 miles had also become a member and the Louisville Interurban had joined with 92 miles of railway. The "supply" members total 127 and represent nearly all of the principal companies manufacturing or selling electric railway material within the territory.

Continuing, Mr. Henry said that the association was formed ten years ago by the union of what had theretofore been an Indiana association and an Ohio association, and its years have been years of prosperity and usefulness. In this connection he mentioned many of the important improvements for which it had been largely responsible, such as the standard code of rules, standard accounting forms and blanks, interurban equipment standards and associated traffic work, the latter including an interchangeable mileage book, improved ways of handling baggage, joint tariff rates providing for through tickets, and an interurban map. In the traffic department Mr. Henry said that perhaps the most important thing pending at this time is the preparation of a joint folder covering the time tables of all the roads within the association and giving full information regarding interline business so that pros-

pective patrons will be able from it to learn just what they can do in traveling over the various electric lines of this territory. This work is in the hands of a special committee, which is now considering bids for its publication. It will of course take some time to complete the work, but when it is done Mr. Henry was sure that every member of the association would be proud of it.

The president also referred to the committee appointed by him to confer with and assist the committee of the American Electric Railway Association in its conferences with the National Bureau of Standards relative to the publication of a code of standards by that bureau. This committee has done valiant and useful work and Mr. Harvie, chairman of the American Association's committee has testified to the great assistance it had rendered. The speaker also referred to the successful boat trip of the association last June and to the three-day trip which the association would take in June next on the Great Lakes.

Mr. Henry then complimented the Union Traction Company of Indiana and its officers and men on their receipt of the Anthony N. Brady medal for the greatest progress made during the year in work to conserve the safety and health of the public and the company's employees. He believed this award would be an additional stimulus in safety work among all the association members. He added that statistics recently compiled by him for forty-nine of the association's interurban members showed that they had carried during 1915 94,610,290 passengers without a single fatal accident, either to passenger or employee.

The speaker then described the different fields which were occupied by the sectional and national electric railway associations and said that they did not duplicate each other's work. Moreover, there had never been the least clash between them. He also paid a tribute to the valuable assistance rendered to the Central Electric Railway Association by those representing the manufacturing and selling part of the industry. On this point he said: "We have had their co-operation from the first, and the force and importance of that co-operation has grown as the years have passed, and our ten years' experience has demonstrated that any electric railway association that does not have the manufacturing and selling part of the industry interested in its affairs and a part of its active membership is not in a position to accomplish in full measure the work to be done by such an association."

THE STATUS OF THE INDUSTRY

President Henry continued as follows: "The last few years have been very trying years to our industry, especially the interurban part thereof. Disappointments have come to the industry because the promoters and builders of interurban roads were not able to foresee the development and growth of their children and consequently could not anticipate the changes that would be necessary in the construction and equipment of such roads and the increase of expense incident to their operation. It never occurred to any one in the beginning of the industry that such expensive construction of track and roadway, or such high-priced heavy cars with the wonderful electrical equipments now in use, costing such large sums of money, would be necessary, nor did they foresee the increased expense of maintenance and operation which would necessarily follow the class of construction and the kind of equipment now demanded. They knew practically nothing at that time of automatic signals, M. C. B. couplers, hot water heaters, air brake equipments and the dozen more incidental matters, the need of which has de-

veloped year by year. Moreover, they could not have understood that within such a short period of time the cost of all material for construction or for maintenance, and the wages of trainmen employed on the cars, mechanics in the shops and help about the power houses and otherwise upon the various parts of the property, would be so largely increased in line with the increased cost of living and other expenses. All of this increase has been on the expense side, and it has been an impossibility to keep up with this increased cost and expense with the rates of fare for travel which were originally thought sufficient for interurban service; nor has it, for various reasons, been possible to make any very considerable increase in such rates of fare. Hampered by legislative restrictions and by rules of, and by rulings made by, the various public service commissions, the interurban companies have practically been held down to the original rates of fare, notwithstanding the increased cost of construction, maintenance and operation referred to. Just about this time there also came into the field a new competitor—the automobile with its high powered engine—which has taken from us a great deal of the patronage we formerly had; and in the city service the 'jitney' style of automobile has worked sad havoc in the receipts of many companies.

"All these things have caused the owners and operators of interurban and city electric lines to study every feature of the situation and to strive in every way possible to hold down the expense of maintenance and operation, and at the same time in some measure, if possible, to make good the inroads made upon their income by the automobile competition. This has been made more difficult in many ways by the now well established and general supervision of these industries by the various public service commissions of the nation and state, as well as the restrictive acts of legislatures and many burdensome provisions by city councils and other city authorities.

"It is a pleasure to me to say at this point that the Public Service Commission of Indiana has, during these trying times, taken a broad, comprehensive and officially patriotic view of the condition of the interurbans, and has sought in many ways to aid them, while, on the other hand, they have thrown very few, if any, obstacles in the way of the managers thereof. This is perhaps largely true on account of the fact that the interurbans on their part have closely and cordially co-operated with the Public Service Commission of Indiana on all questions involved in the construction, maintenance and operation of these roads, so that there has been very little friction between the commission and the electric railway companies. I understand that the commissions of the other states in which the electric railway members of this Association are located, have shown a very similar disposition, but I am not familiar enough with the details to discuss them and, therefore, confine my statement to the State in which I live.

"Nothing in recent years has come into the lives of the American people—city, town and country—that has been of more benefit to them and added more to their convenience and happiness than the interurban service, and these people, when they fully understand the questions involved in the situation, will not see that service crippled when anything they can reasonably do will prevent it. The automobile has of course come into the transportation field to stay and will continue to fill its legitimate part, but the 'fad' feature of automobile riding will gradually wear off, and the time will soon be here when a very large part of the people will cease to think of automobile rides, and the interurbans will carry their old time allotment of passengers. It will be found that we can spread and extend our passenger

service in various ways, especially in long distance rides which are already being secured in satisfactory numbers by improved equipment and added service. There are other fields also for us to cultivate. We must push our service strongly in the freight and express line because there is a very large part of this business to which we are justly and fairly entitled, and which we can take care of and handle better than the steam railroads, and from it we may secure large and profitable revenue. I anticipate, therefore, that at no distant day the receipts of the interurbans will be fully up to what they ought to be. We can not expect, nor indeed ought we to expect, any large increases in the rate of fares, for it is the cheap fare of interurbans which has largely given us the field we have. No doubt the legislatures of the various states will, as they ought in the interest of steam railroads, repeal the statute which makes a minimum fare of 2 cents per mile, for it is evident to every one that the steam railroads can not perform the service demanded of them for the rate of fare they are now permitted to charge, and there are some electric railways which may be obliged to increase their fares above 2 cents per mile. We must, however, in most cases, look to increasing the amount of our patronage rather than the charge we may make for the service.

"On the other hand, with the public fully educated as to the needs of the interurbans and the difficulties they have to contend with, we may reasonably expect that many of the burdens can be removed from our shoulders. We ought not to be charged with the expense of street improvements in the villages, towns and cities; the taxes against us ought not to be over-burden-some; and the public should, and will, assist us in bring-

ing about a change of public sentiment to the extent that false claims can not be successfully prosecuted against us growing out of accidents where no real injury or, at best, only a slight injury is suffered by the claimant.

"Let us, therefore, bend our energies to the education of the public mind so that it will be generally understood and accepted that we are acting as agents of the public, furnishing them service which they find it to their advantage to have us furnish rather than to undertake to operate the railroads themselves. With this idea fully established in the public mind, the entire situation will be changed and the public will be our friends on all proper occasions.

"This association has a great future before it; it will not live or attempt to live on its past work but will go forward along such lines as may from time to time be marked out, strengthening and fortifying the industry in all its weak places, giving constantly improved service, making our lines more popular with the traveling public, and by this means bring to our stockholders and bond holders a reasonable compensation for the money they have invested and will invest in these properties.

"I thank you, gentlemen, for the uniform support which you have given me during my administration; but for this support, I should not have been able to accomplish anything; with it, I have tried to do the best I could during the twelve months that you have permitted me to act as your president. With the adjournment of this convention, I will cease my official connection with the association, but I assure you that my interest in it will not in the least lag because I am not officially connected with you."

N. Y. E. R. A. Holds Meeting in Albany

Governor Whitman and Prominent Municipal Officials and Railway Executives Address Members on Feb. 24—Discussion on Feb. 25 Was Focussed on Shop Methods, Car Heating and Ventilation, Fare Collection and Mutual Indemnity Insurance

THE returning prosperity of the country was evidenced by the splendid attendance of about 200 members at the dinner on the evening of Feb. 24 opening the quarterly meeting of the New York Electric Railway Association. The dinner, which was held at the Ten Eyck Hotel, Albany, N. Y., was a success not only in numbers and menu but also in the list of splendid speakers whose names had been kept secret most successfully. When John J. Dempsey, president of the association, announced their Honors the Mayor of Albany, the Mayor of Troy, the Secretary of State of New York and the Governor of New York as the public's spokesmen at the gathering, the situation was not unlike that of an old-fashioned surprise party.

During the dinner J. F. Stevens, Mayor of Albany, welcomed the delegates to Albany and pledged them the freedom of the city. After the dinner the first speaker introduced was Governor Whitman, who discussed in a general way the point that the great problems confronting the State to-day are not to be solved solely by legislators and executives, but that the public must depend upon the wisdom and loyalty of the great number of men trained along all the lines of business (including the electric railway industry) that are of vital concern in the nation's life. Governor Whitman said that more dissatisfaction in regard to electric railway service

would always exist in the crowded centers, but that it must not be supposed that the carriers did not have officials of the greatest fitness, actuated by the most sincere and honest motives in performing service not only for the benefit of the stockholders but also for the better welfare of the public.

Francis M. Hugo, Secretary of State, described the growth of the automobile industry and also of electrical enterprises and emphasized particularly the need of co-operation of steam railroads, electric railways and automobiles in the "preparedness" movement, as well as the necessity for a state-wide plan in regard to the elimination of grade crossings. He said that the State had not done its entire duty in this latter regard, and he made a plea for larger appropriations and more co-operation on its part to destroy the grade-crossing evil. Mr. Hugo also stated that the prosperity of public utility corporations is intimately connected with the prosperity of the communities, and he deprecated the legislative interference of past years. This, however, is now decreasing, for the public has come to a better realization of the benefits to be derived through co-operation with all the business institutions of the country, including the public service corporations.

Cornelius F. Burns, Mayor of Troy, mentioned the need of better co-operation between utilities and municipi-

palities. Other speakers were: C. S. Sims, vice-president and general manager Delaware & Hudson Railroad, and Edward A. Maher, Jr., assistant general manager Third Avenue Railway, New York, N. Y. Mr. Sims in connection with the subject of "dinners" made a few witty remarks about some railways "eating" more than their earnings. Mr. Maher spoke of the importance of electric railways in the State as the largest taxpayers and employers of labor, and he praised the assiduity with which they are constantly studying the problem of better service to the public. He asserted that railway officials should not approach regulatory bodies with a supplicating or cringing attitude but with confidence that they will obtain what they are entitled to for their service to the riding public.

A report of the technical sessions on Feb. 25 will appear in next week's issue. Abstracts of two of the papers are presented below.

Modern Shop Methods

BY P. V. SEE

Superintendent of Car Equipment Hudson & Manhattan Railroad,
New York

On the Hudson & Manhattan Railroad the average daily car mileage is 118, the average schedule speed is 17.3 m.p.h., including 1.6 stops per mile, and the schedule speed on the high-speed line is 28 m.p.h. During a day each car encounters curves amounting to forty-two complete round turns and ascends grades equivalent to an elevation of 4685 ft. The minimum radius of curves is 90 ft. and the maximum grade is 5 per cent. All cars have two-motor equipments with full automatic multiple-unit control. Six-car and seven-car trains are operated during rush hours under ninety seconds headway, being controlled with automatic signals and train stops.

Under the above conditions rigid inspection is necessary. Each inspector is paid a bonus of 25 cents per day when his equipment causes no trouble for a week or when he passes a weekly inspection test. This test is made by a man not connected with the inspection force and consists in noticing existing defects or making artificial ones on cars before they enter the inspection shop and checking afterward to determine whether or not the repairs have been made. All work done in the repair shops is checked by the inspection force, and the inspection shop is never allowed to claim that road trouble is the fault of the repair shop.

While the practice of the company is to have repairs made in the shops as far as possible, nevertheless certain classes of light repairs and train defects have to be repaired by road trouble men. A scheme of picking out the best men for this work is employed in which a train in the yard is disabled and the men are tested individually by being put upon the task of repairing it under conditions as nearly as possible like those of the road.

In inspecting the electrical jumpers used in making up trains, one Sunday every three months is devoted to jumper inspection. A jumper test train is taken over the road, stopping at each terminal long enough for the crew to collect all jumpers in the terminal. These are brought into the test train and inserted in sockets wired to the testing board. A current of 25 amp. from the heater circuit is sent through all the jumper wires connected in series, and a 10-point switch is so connected that on each point a 3-volt lamp is connected across one of the jumper wires. While current is passing the jumper is worked back and forth. Both heads are tested at the same time for grounds.

On this road the numerous sharp curves caused the end thrust of the motors to wear out the axle lining collars rapidly. Bronze shims screwed to the lining

collars also wore out soon, but collars of high-grade tin babbitt wore better than the original bronze of the lining. The babbitt is cast in a dovetail groove in the collar. Wheels are shrunk on the axles, after heating with gas rings on tread and hub. After cooling the fit is tested in a press to 75 tons.

Traffic conditions on the Hudson & Manhattan Railroad do not permit the setting of control relays by test runs. Also it was desired to set the current element of the relays high to provide power to start trains on 4½-per cent grades with one-half of the cars inoperative. Hence the adjustment is made on the time element by adjustment of the air dashpots with the aid of a stop watch, the current control being set with a 5-volt generator so that the armature will just drop at 525 amp.

The practice of the company in car painting is to use forced drying. For complete repainting the steel is cleaned with the sand blast, six nozzles being operated at once. A car can be cleaned and a priming coat applied in one day. Tests have shown that a No. 16 steel sheet can be cleaned 100 times before it is worn through. After sand blasting a car receives four coats of paint, and with the accelerated drying process three coats can be applied in one day, although two is the usual number. The drying is done in a portable canvas tent by means of electric heaters (See ELECTRIC RAILWAY JOURNAL, March 20, 1915, page 584).

The car-cleaning practice of this company consists in applying paraffin oil with floated silica and then brushing with rotating window brushes driven by small electric drills. This is done once a month at a cost of about \$1 per car, 12 cents being for materials and 90 cents for labor. The treatment is not injurious to paint or varnish. Whiting and water are used in cleaning interior surfaces with high-gloss enamel finish.

Heating and Ventilation of Urban Cars

BY HORACE A. ABELL

Assistant Engineer Schenectady (N. Y.) Railway

In order to determine the relative economy of different heating systems for electric railway cars in connection with a modern ventilation system, the Schenectady Railway recently conducted a series of tests on three of its cars which had 28-ft. bodies, an over-all length of 40 ft., and a seating capacity of forty. During the tests, which lasted from Jan. 3 to Feb. 8, 1916, the three cars were operated on the same city line, the operating conditions being kept as nearly the same as possible.

Of the test cars, one, No. 507, was equipped with a coal-burning heater and forced-ventilation system. Test car No. 509 was electrically heated with thermostatic control, having sixteen heating units in the body of the car, and three units in each vestibule. For these heaters, the first circuit consisted of No. 20 wire with a resistance of 13 ohms cold, and a second circuit of No. 20 wire, resistance 10 ohms cold. Test car No. 511 was electrically heated without thermostatic control but in all other respects was similar to test car No. 509. Temperatures in this car were regulated, within the limits of error of the motorman, in accordance with the railway company's system of heat signals, under which flags of different colors are displayed at several important points along the different lines to instruct the motorman as to the point of heat to be used. Thus, with an outside temperature ranging between 35 deg. and 45 deg. one point of heat is used, with an outside temperature ranging between 20 deg. and 35 deg. two points, and with an outside temperature less than 20 deg. three points.

Standing tests on the coal-burning heater on car No.

TABLE I.—COMPARATIVE DATA ENTERING INTO OPERATING COSTS OF DIFFERENT TYPES OF HEATERS

	Car No. 507. Hot-Air Heater	Car No. 509. Electric Heater with Thermostatic Control	Car No. 511. Electric Heater without Thermostatic Control
Cost of heating system installed	\$131.00	\$122.00	\$107.00
Interest and depreciation	5% and 10%	5% and 7%	5% and 6%
Weight of system complete	450 lb.	475 lb.	475 lb.
Coal consumption, per 100 car-hours	630 lb.	.....	.....
Power consumption, per 100 car-hours	18 kw.-hr.	849 kw.-hr.	1,064 kw.-hr.
Cost of repair and maintenance per 100 car-hours	\$0.045	\$0.125	\$0.120

507 showed that after the stove had attained its maximum capacity, the temperature of air at the first duct opening in the hot-air line had a temperature of 238 deg., while the eighth or last duct opening gave a temperature of 167 deg., the inside air being recirculated through the stove. When outside air was forced through the stove these temperatures were lowered respectively to 222 deg. and 151 deg.

The principal sources of error encountered in conducting the tests were inaccuracies in reporting the departure and arrival of cars at the station and failure of motormen to follow the heat signals, thus making the power consumption on the car too high or too low. In a number of cases also it was found that cars were left standing in the carhouse with the trolley pole up and with the heat turned on, thus increasing the power consumption per car-hour for the heaters.

From summaries of the results obtained in the tests the accompanying Tables I and II were prepared. These are based upon the direct readings obtained in the tests. However, the inside temperature of car No. 507 was considerably higher than that found in either car No. 509 or car No. 511, because more heat units were delivered by the coal-burning outfit. If allowance is made for this fact, the average cost of energy supplied to car No. 509 should be \$15.13 instead of \$10.61 per 100 car-hours, as shown in the table, and for car No. 511 the corresponding figure should be \$15.13 instead of \$13.30.

Interior temperatures of the cars were determined from thermometers placed at four different locations: (1) Equidistant between breathing level and car ceiling; (2) at breathing level; (3) equidistant between breathing level and car floor; (4) at car floor. The readings showed that, with the coal-burning outfit on car No. 507, the average temperatures were respectively 60 deg., 61 deg., 68 deg. and 51 deg. during a period when the average outside temperature was 21 deg., and the average number of passengers in the car was twenty. On car No. 509 the temperatures at the four locations averaged respectively 53 deg., 54 deg., 53 deg. and 52 deg., and on car No. 511 the corresponding figures were 56, 53, 56 and 52. The low temperatures on car No. 509 resulted in its withdrawal from service several times during tests because of complaints of insufficient temperature by patrons, and from this it was deduced that thermostats should be so set as to maintain inside temperatures between 56 deg. and 60 deg.

Another feature of interest in connection with the tests was the discovery that, during a period of seven days when the average outside temperature was 21 deg., an average saving of 36 per cent could have been made in amount of current used by car No. 511 if the motorman had observed instructions perfectly in regard to heater operation. It was found also that the percentage of moisture in car No. 507 varied from 39 per cent to 49 per cent, in car No. 509 from 42 per cent to 52 per cent, and in car No. 511 from 52 per cent to 62 per cent.

TABLE II.—OPERATING COSTS OF DIFFERENT HEATERS ON BASIS OF 100 CAR-HOURS

	Car No. 507 Coal-Burning Heater with Fan	Car No. 509. Electric Heater with Thermostatic Control	Car No. 511. Electric Heater without Thermostatic Control
Interest and depreciation	\$0.391	\$0.291	\$0.234
Maintenance and repairs	0.045	0.125	0.120
Cost of hauling	0.329	0.347	0.347
Cost of coal	1.768	.....	.....
Cost of power	0.225	10.609	13.304
Labor of attendance	0.532	.....	.....
Total cost	\$3.290	\$11.372	\$14.005

TABLE III.—VENTILATION TESTS ON SCHENECTADY CARS

	Cubic Feet of Air (per Minute— Intake Exhaust)		Time required in Minutes to Effect Complete Change of Air	Number of Changes of Air per Hour
Car No. 507.—Fan stopped	559	475	4.0	15.0
Car No. 507.—Fan running	396*	367	5.6	10.7
Car No. 509	531	396	4.2	14.3
Car No. 511	475	348	4.7	12.8

Jan. 21, 1916. Weather—partly cloudy. Direction of car movement—east and west.

*Exclusive of intake by fan, amounting to 225 cu. ft. per minute. Total inflow 621 cu. ft.

In connection with the ventilation of the cars during the tests, it might be said first that authorities differ as to the volume of air necessary for good ventilation, estimates varying from 1000 cu. ft. to 3500 cu. ft. of fresh air per person per hour. Still other eminent authorities base their recommendation on a change in air in street cars from three times to six times per hour, irrespective of the number of passengers. The latter method seems to be the simplest, as it eliminates the frequent readjustment of the ventilation system. In all cases during the tests, these figures were greatly exceeded, as shown by Table III.

In each of the test cars six sets of automatic ventilators were installed on the monitor roofs. Anemometer readings were taken of the flow of air at the ventilators while the car was in service and operating at the average schedule speed. Readings were taken at ten-second intervals, and the displacement per minute was determined from the average of these.

In the results shown on Table III it should be noticed that in addition to the ventilator inflow approximately 225 cu. ft. of air per minute was forced into the car by motor-driven fans on the coal-heating units. This gives a total of practically 621 cu. ft. of fresh air forced into the car, of which 367 cu. ft. went out through the ventilators and 254 cu. ft. went out through openings around doors, windows, etc. If the amount of fresh air introduced into the car is taken as a basis, a complete change of air is shown to take place every 3.6 minutes, or 16.7 complete changes per hour. Therefore it is obvious that the equipment on car No. 507 with the motor on the coal-burning unit in operation gave the greatest number of changes of air per hour, and this indicates that a better quality of air should be found in cars using this system of heat and ventilation.

Robert S. Stewart, vice-president and general manager of the United States Motor Truck Company, Cincinnati, Ohio, a recent visitor in Louisville, prophesies that the day is not far distant when railings will be imperative in large cities where the traffic is thickest. Mr. Stewart cited the increasing number of accidents which result from the practice of pedestrians crossing the streets at places other than regular crossings. Mr. Stewart said that the construction of railings at the edges of the sidewalks, with openings at regular crossing points, ought to go far toward removing the dangers traceable in part to increasing use of automobiles.

COMMUNICATIONS

Durability of Electrically-Welded Resistance Grids

PENNSYLVANIA RAILROAD COMPANY
SUNNYSIDE ENGINE HOUSE

LONG ISLAND CITY, N. Y., Feb. 21, 1916.

To the Editors:

In reply to an inquiry regarding the life of the electrically-welded grids described in my article printed in the issue of the *ELECTRIC RAILWAY JOURNAL* for Feb. 12, page 322, I would report as follows:

The first electrically-welded grid was installed on one of our electric locomotives on Sept. 24, 1914, and has not shown any deterioration as yet. As stated in my article, the grids came in for rebuilding about once in eleven months before the practice of welding was begun. We have about eighty-five of these electrically-welded sets of grids in service, and as far as I can see they will last indefinitely. There is no reason why the electrically-welded parts of the grids should not last as long as the resistance parts, as the former parts have about three times the area of cross-section of any other part. The conductivity of the joints is so low that there cannot be any heating in them. THOMAS B. RAY,
Electric Locomotive Repairman.

Collection of Corrugation Data Urged

DALLAS, TEX., Feb. 17, 1916.

To the Editors:

Referring to recent letters in the *JOURNAL* on rail corrugation I have to take issue with Mr. McWhirter in his theory as to rigid track being the cause, and with Mr. Mullaney in his theory as to the cause being the use of rolled-steel or steel-tired wheels. My reason for so disagreeing is that I have in mind many cases where such corrugation has occurred, and is occurring, on long stretches of the so-called elastic track, ballasted on dirt and ballasted on concrete, and also on track which has never had any traffic on it but that of cast wheels.

This is merely negative testimony, it is true, and only goes to prove that either the corrugation of rail is not due to any one cause or that no one has yet found the one proved cause—if there is only one. The perplexing fact to me is that stretches of rail will be free from this defect for quite a long period of use and will then develop corrugations without any known change in traffic conditions. I have also found places where corrugations have developed in one spot, but have never spread much farther and other places where this spot has spread for blocks. In fact, from experience and from the information derived from others, rail corrugation seems like Topsy in "Uncle Tom's Cabin," "it just grows!"

I believe that we could get nearer to the actual cause, or causes, if we had more exact data from actual experiences, and this letter is to suggest that we each discard all ideas as to the cause and devote our time for a while to a complete record of the effects. The actual cause lies between the wheel and the rail, but the wheel is only a single part of a complex object—the car body, and it might be that there are matters of oscillation of truck or body that would originate the corrugating. Again, the same is true of the rail. It is part of a complex structure and either in that structure or inherent in the manufacture of the rail itself may lie the cause of corrugation.

Therefore, the data collected on this subject must be

exceedingly full as well as exact. All possible causes, however seemingly remote, must be recorded, for many matters have arisen in operation where the actual cause was remote and would not have been suspected until facts developed it. It seems to me that the committee on this subject could get up a form mentioning every one of the possible causes of rail corrugation, and have every operator of a railway, where such corrugation occurs, keep his facts on this form as fast as observed and verified. Such a uniform set of observations, free from bias or prejudice, would tend to give us the true solution of this problem much sooner than will a hundred separate experiences not complete as to all possible causes and biased by preconceived theories.

H. S. COOPER.

New York State Bond Figures

NEW YORK, Feb. 23, 1916.

To the Editors:

A further analysis of the statistics for electric railways in New York State outside of New York City, published in the *ELECTRIC RAILWAY JOURNAL* of Feb. 12, may be of interest. They showed that the chief reasons for the decrease in net income from 149.6 per cent of the 1907 results in 1911 to only 32.5 per cent of these figures in 1915 were the large increases in taxes and interest charges. During the same period the tax accruals jumped from 162.6 per cent to 224.5 per cent and interest charges from 139.1 per cent to 211.3 per cent of the 1907 returns. This increase in interest charges is worthy of examination, lest one should think that the sole cause was the rising cost of railway capital. As a matter of fact, since 1907 the funded debt has been increasing more rapidly than the stock. On June 30, 1907, the capital stock outstanding was about 57 per cent and the funded debt about 43 per cent of the total capitalization, while on June 30, 1915, the corresponding proportions were 47 per cent for capital stock and 53 per cent for funded debt. Of the total increase of about \$50,000,000 in funded debt since 1907, \$28,000,000 represents roughly the liabilities of the Empire United Railways, Inc., for one-third and of the New York, Westchester & Boston Railway for two-thirds. Thus, while the increasingly large proportion of bonds helped to swell the interest charges, the large new issues mentioned had a vital effect to this end. It is probable that the tendency of interest rates since 1907 has been upward, and that a rather large proportion of the securities authorized was for the development of existing properties rather than for refunding or for entirely new enterprises, but the determination of the relative importance of these as well as the other factors must await a more intensive study of the situation.

ACCOUNTANT.

The First Company Publication

VIRGINIA RAILWAY & POWER COMPANY

NORFOLK, VA., Feb. 21, 1916.

To the Editors:

I note a little paragraph in the *JOURNAL* for Jan. 15 in which the traction company of Sioux Falls, S. D., claims the honor of having been first in the field of company publications with their folder *On the Cars*. In this connection I would like to state that our company, which was then the Norfolk, Portsmouth & Newport News Company, about 1903 started the publication of a little weekly folder which we called *Street Railway Chat*. This has been discontinued several times for intervals of a year or two, but a little more than a year ago it was again revived and enlarged and the name changed to *Public Service Chat*.

E. C. HATHAWAY, Assistant General Manager.

American Association News

Manila Section Jubilant Over Medal Award—Section No. 9 Organized in Portland, Me., by Employees—
Gen. George H. Harries Discusses Preparedness in Newark, N. J.—Five Company
Membership Enrollments Made Under New Constitutional Provisions

Activities of the Company Sections

MEDAL NIGHT IN MANILA

On Jan. 4 J. H. Pardee, president of the J. G. White Management Corporation, operating managers of the local property, was the guest of honor at an open meeting of Meralco section in Manila. Five hundred persons were in attendance, the meeting being held in the roof garden on the company's building where there are

accommodations for large gatherings. Walter A. Smith, newly-elected president of the section, presided.

C. E. Haywood, chairman of the program committee, announced the following as the winners of the medals offered by the company for the best three papers presented before the section during the past year, those by officers of the company and by J. M. Bury, winner of the association medal, being debarred

from the competition: Gold medal, W. B. Calfee, night carhouse foreman, for his paper on "Personal Efficiency." Silver medal, B. H. Blaisdell, chief engineer of power plant, for his paper on "The Power Plant Department's Part." Bronze medal, Oscar Keesee, for his paper on "The Duties of a Transportation Superintendent."

Mr. Pardee then presented the association gold medal to J. M. Bury, assistant superintendent of transportation. This had been awarded to him for his paper* on "Courtesy." (See *ELECTRIC RAILWAY JOURNAL*, May 29, 1915.) In presenting the medal Mr. Pardee expressed the gratification of the other officers of the company and himself that the medal had gone to an employee of the Manila company, and emphasized the value of the award in view of the strong competition for it.

*The *Manila Daily Bulletin* of Jan. 5 printed Mr. Bury's paper in full.

C. N. Duffy, vice-president, then handed Mr. Bury a check for 100 pesos, which he had agreed to give to the winner of an A. E. R. A. or N. E. L. A. company section medal. He referred to the fact that he had received the first medal, that a member of the Milwaukee section which he had helped to inaugurate had won the second, and that now a member of the Manila section had won the third medal, all of which was highly gratifying. Mr. Duffy pointed out that there were opportunities ahead of every man, and if he proved capable of embracing them he would advance.

The twelfth meeting of the section, held on Dec. 13, 1915, was a business meeting, the following officers being elected: President, Walter A. Smith, purchasing agent; vice-president, J. M. Bury; secretary, Arthur J. Grant, superintendent of lighting and power installations, and treasurer, H. P. L. Jollye, assistant auditor. William A. Seten, sales agent, was elected director for four years.

NEW SECTION ORGANIZED WITH 1.1 MEMBERS PER MILE OF TRACK

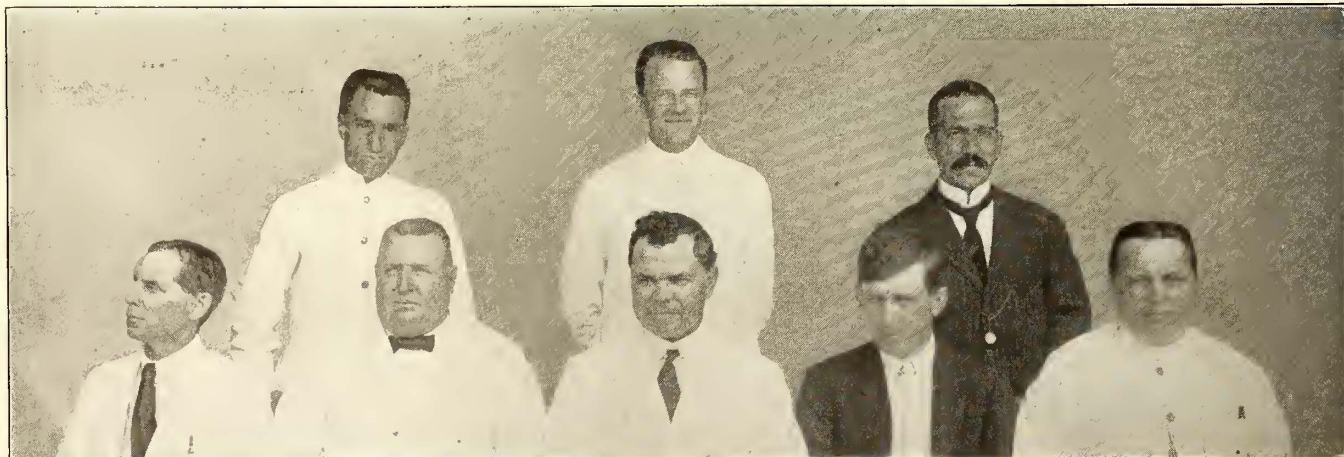
Company Section No. 9, that of the Cumberland County Light & Power Company, was organized in Portland, Me., on Feb. 19 with 122 members.

The section originated in a conference of eight men of the transportation department, two from each division, who met at the suggestion of President A. H. Ford to consider the feasibility of the formation of a section. They appointed, as temporary officers to report a plan, H. J. Bangs, conductor city division, chairman; J. F. O'Neil, clerk mechanical department, secretary, and W. W. Blake, assistant superintendent of track, treasurer. The understanding was that the section, if formed, was to be an employees' organization.

The organization meeting was attended by more than 150 men. It was addressed by E. B. Burritt, secretary of the association, H. C. Clark, editor *Aera*; H. H. Norris, *ELECTRIC RAILWAY JOURNAL*; Martin Schreiber,



MERALCO JOINT COMPANY SECTION MEDAL



OFFICERS AND DIRECTORS OF MANILA JOINT COMPANY SECTION

Seated, left to right: B. H. Blaisdell, J. M. Bury, W. A. Smith, A. J. Grant, W. A. Seten; standing, left to right: R. Lopez, J. C. Rockwell, C. M. E. Pereira.

chairman committee on company sections and individual membership; C. C. Peirce, vice-president of the Manufacturers' Association; A. H. Ford, vice-president and general manager of the company, and William H. Bradley, president. Mr. Burritt outlined the plan of presenting the section work by himself and other speakers and explained in detail the association organization. Mr. Clark traced the history and aims of the association magazine and requested co-operation in its further development. Mr. Norris gave illustrations of section meetings in the attempt to picture their spirit. Mr. Schreiber told of the work of the sections and showed what the individual member can get from his membership. Mr. Peirce, who was on home ground, gave reminiscences of the early days of the local railway, stated some of the problems of the industry and tried to stimulate his audience to a heartier co-operation in the solution of these problems. Messrs. Bradley and Ford expressed the sympathy of the management with the movement, stating that the officers have something to learn from the men and vice versa.

After the adoption of a constitution the following were elected to the positions named: F. H. Knight, superintendent of track, president; Mr. Bangs, vice-president; Mr. O'Neil, secretary; Mr. Blake, treasurer, and Richard Bennett, clerk commercial department; F. Perley Stanford, conductor Westbrook division, and Victor Brewster, motorman Deering division, directors.

PUBLIC SERVICE SECTION

A meeting of the Public Service Company section was held in Newark on Feb. 17. Two addresses were scheduled; one by Joseph Crawford, trolley inspector of the Board of Works of Newark, the other by Gen. George H. Harries, vice-president H. M. Byllesby & Company.

Mr. Crawford was a member of the "Red Special" party which went to San Francisco last fall to attend the convention of the association in that city. In his lecture he showed a number of interesting views which he took on the trip, among them the methods of marking safety zones in streets in San Francisco, of indi-

cating the cross streets by lettering placed in the concrete curbstones, or set into the pavement near the corner, methods of indicating on the lampposts the nearest house numbers, etc.

The talk of General Harries was on "Preparedness," and the speaker described from actual experience the condition of unpreparedness which existed during the Spanish-American war in 1898. The response of the country to volunteer was prompt, but in many cases the officers and men among the volunteers were untrained. Thus, of seventeen volunteer regiments with which General Harries was acquainted, 60 per cent of the men had never fired a military rifle, and very few understood the first principles of camp hygiene. General Harries emphasized the idea that fighting was only a part, and perhaps a very small part, of a soldier's life. Under the circumstances, there is little wonder that there was great suffering and many unnecessary deaths, as patriotism by itself will not win.

General Harries then pointed out how railway men could assist in the present plans of preparedness. The American Electric Railway Association had authorized the appointment of a committee to co-operate with the War Department, and probably there will be appointed a member on that committee from each military division of the country. Practically every harbor defense along the seaboard has close to it an electric railway, and among the other things which the committee could do would be to determine the best way of utilizing these electric railways and others for the transportation of troops and supplies to these defenses, and from one defense to another, and the connections necessary between these electric roads and the nearest steam roads. It would be very desirable, he said, to have one representative of the committee in each district thoroughly conversant with the transportation situation and working through a sub-committee of transportation men, and to have the machinery of transportation, when the need came, operated by transportation men. When the plans were farther advanced the speaker promised to describe them more in detail, and he hoped for cordial co-operation on the part of the electric railroads.

Activities of the Committees

POWER DISTRIBUTION

A meeting of the Engineering Association committee on power distribution was held in Cleveland, Ohio, on Feb. 2 and 3. In attendance were C. L. Cadle, chairman; E. J. Blair, E. S. Gillette, C. R. Harte, M. J. Kehoe, C. P. Phenecie, R. H. Rice and C. F. Woods. The meeting was called for the purpose of considering sub-committee reports. Condensed minutes of the meeting follow.

A sub-committee reported that, as the national joint committee on overhead and underground line construction had not completed the pending revision of the specifications upon which it is working, nothing could be reported at the time. The revisions of the standard specifications for rubber insulated wire were being studied but no recommendations were ready, and the same was true in regard to the A. I. E. E. standardization rules.

Another sub-committee submitted a progress report on a clearance diagram for semaphore signals, stating that it had met with the joint committee on block signals on Feb. 2. On the subject of line material specifications it was stated that arrangements have been made for a meeting of associations and individuals interested in obtaining a standard for insulator pin threads. C. R. Harte represents the Engineering Association. Further specifications for overhead line mate-

rial are being drawn up and data are being collected relative to possible standard specifications for high-voltage direct current and catenary construction. The latter will be submitted at the next meeting.

Other sub-committees reported progress on the collection of concrete pole data, third-rail construction data, and the proposed national electrical safety code of the National Bureau of Standards.

STANDARDS FOR CAR LOADING

This committee met in New York on Feb. 16 and arranged for the securing of additional data from member companies. Those present were S. W. Huff, chairman; E. J. Cook and W. F. Ham.

Enrollments Under Revised Constitution

Five companies have to date enrolled as members of the association under the new constitutional provision admitting other than railway companies to membership. These, in order of enrollment, are the General Electric Company, the Drew Electric & Manufacturing Company, the McGraw Publishing Company, Inc., the Westinghouse Electric & Manufacturing Company and the Aluminum Company of America.

The secretary is now beginning to send out formal invitations to companies eligible to membership.

EQUIPMENT AND ITS MAINTENANCE

Short Descriptions of Labor, Mechanical and Electrical Practices
in Every Department of Electric Railroading

Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.

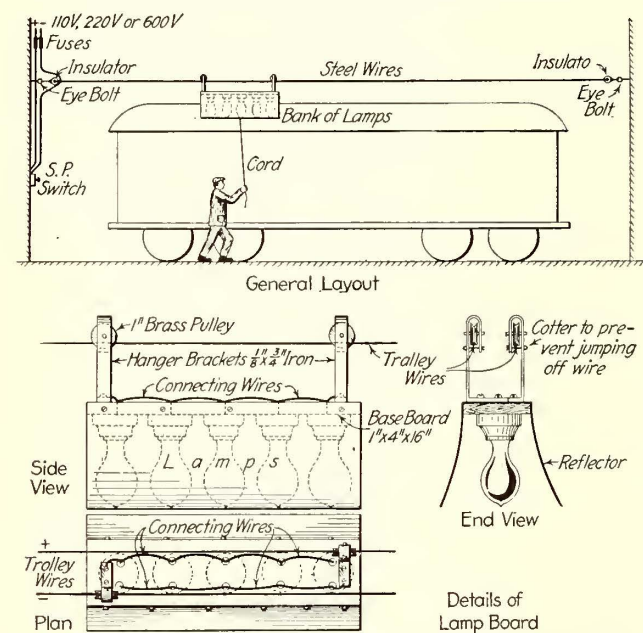
A Trolley Lighting Scheme for the Paint Shop

BY G. R. W. ROBERTS

General Foreman Electric Car Equipment Southern Pacific Company, Beaverton, Ore.

In order to meet the demand imposed by the short winter days for additional lighting in shops to permit painting and other work on the cars to be done to advantage, the writer has devised a movable lighting scheme of simple construction, shown in the accompanying illustration, which has proved very convenient and effective.

Two lines of steel or iron wire, steel preferred, are mounted on strain insulators and stretched tight between points on each side of the car to be worked on. One wire forms the positive lead and the other the negative lead for the lamp circuit. The voltage may be that used for the shop lighting, 110 or 220 volts, or that required for operating the trolley car, 600 volts, the



LAYOUT AND DETAILS OF PAINT-SHOP LIGHTING SYSTEM

lamps being wired either in parallel or series. Suspended from the two wires, which are about 4 in. apart, is a board to which the lamp sockets are screwed on the under side. The board has on top two hanger brackets with small brass pulleys, which are grooved very deep. These hanger brackets carry the current from the wires to the lamp sockets, and the wheels run on the wires from one end of the shop to the other, so that a strong light is supplied exactly where needed for painting, lettering, etc. The lamp board is pulled along the wires by means of a light cord, which hangs from it, reaching to within 5 ft. of the floor. The cord is easily reached, yet does not get in the way of anything. A switch is placed on the wall at a convenient point to control the light. A reflector on each side of the lamp board directs the light downward upon the car. In some shops it may

only be necessary to run the wires on one side of the car, away from the windows, and where two tracks come together one bank of lamps will be enough to serve both tracks.

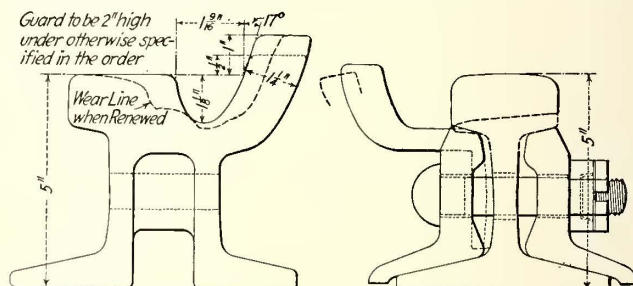
Use of Manganese Steel in Plain Curves

BY M. BERNARD

Assistant Engineer Way and Structure Department Brooklyn Rapid Transit Company

In the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 20, 1915, in an article referring to car life of plain curves, data were given for two plain curves located under the Brooklyn Bridge Deck near Fulton and Tillary Streets, Brooklyn, a comparison being made between the life of manganese steel and open-hearth steel rails.

The east-bound curve in this construction was renewed on Oct. 27, 1915. It is located at the foot of a $4\frac{1}{2}$ per cent grade and the middle radius is 37 ft. $7\frac{1}{2}$ in. The construction consisted of a 5 in. double-web manganese steel inner rail, as shown in full lines in Fig. 1, and an 80-lb. A. S. C. E. open-hearth steel outer rail with bolted on guard as shown in Fig. 2. This curve had been installed in April, 1909. According to our record



MANGANESE STEEL IN PLAIN CURVES—FIG. 1—INNER RAIL; FIG. 2—OUTER RAIL

3,650,000 double-truck cars passed over this curve during its life. In the new curve the same construction has been retained for the inner rail. The outer rail, however, was made of manganese steel, it having been found by inspection previous to the renewal of the curve that the head of the outer rail had been worn off almost completely in a vertical direction, although the gage line had remained almost intact, due, no doubt, to the protection afforded by the inner manganese steel guard. Sections of the two rails are given in Figs. 1 and 2, and the condition described above is indicated by the lines below the head.

This is one of the few locations on our system where the use of manganese steel construction seems to be economical. The life of the original curve containing the 70-lb. A. S. C. E. open-hearth steel, double T-rail was one year and four months. That of the curve described above was six years and six months, which is 4.87 times the life of the original curve. An analysis shows that by the use of manganese steel a saving of about \$1,000 was effected. It is a coincidence that this is equal to the excess cost of the manganese steel installation over the open-hearth steel installation, the former having cost \$1,600 and the latter \$600. An analysis also

shows that there would have been no saving if the life of the manganese steel installation had been less than three times that of the open-hearth steel construction.

Labor-Saving Gig for Distributing Long Poles

BY S. L. FOSTER

Chief Electrician United Railroads of San Francisco

The appliance shown in the accompanying cut is called a gig, and has been the means of saving the United Railroads considerable labor in the distribution of long high-tension wood poles where the haul was not too long or where the ground was unusually difficult to drive over.

The device consists of a pair of sturdy wheels 4 ft. in diameter, a 2½-in. x 2½-in. x 5-ft. 8-in. arched axle and an 11½-ft. oak pole, the pole having a short iron hook at its axle end for quickly attaching it to its load.

The method of rapidly and easily attaching the heavy pole to the gig at this hook is by means of a grapple consisting of a heavy iron ring, a shackle, two links and two sharp extra heavy hooks patterned after the metal element of a canthook and working somewhat like the well-known iceman's tongs but without the hinge, as shown in the illustration. The points of the hooks are driven into the pole by a hammer.

When the setting of tall poles is under way, the digging and raising tools are hauled to the job by a two-horse wagon and the holes are dug first. While the hole digging was in progress this team used to be idle, the pole hauling having been previously done by another and larger team. If the poles have been delivered by car, as is usually the case, in a pile at some near-by central point, they can be picked up one at a time by the use of this otherwise idle two-horse team and the gig, and distributed at the sites of the holes as fast as required by the pole setters.

The 12 to 1 leverage furnished by the 11½-ft. pole and its 11-in. distant hook enables the wagon driver, aided by one man, to readily swing the 50-ft., 60-ft. or 70-ft. pole up under the axle of the gig well clear of the ground by the tongs and to so balance it that the other end of the pole can be easily raised and fastened to the rear wagon axle. The end of the gig's pole is lashed to the load by a chain. The ice tong idea eliminates all heavy manual lifting or adjusting of slings around the

heavy pole and all dragging of poles along the ground. Arriving at its proper location the pole is equally readily unloaded by the two men. By the time the day's holes are dug the poles are all delivered ready for being set.

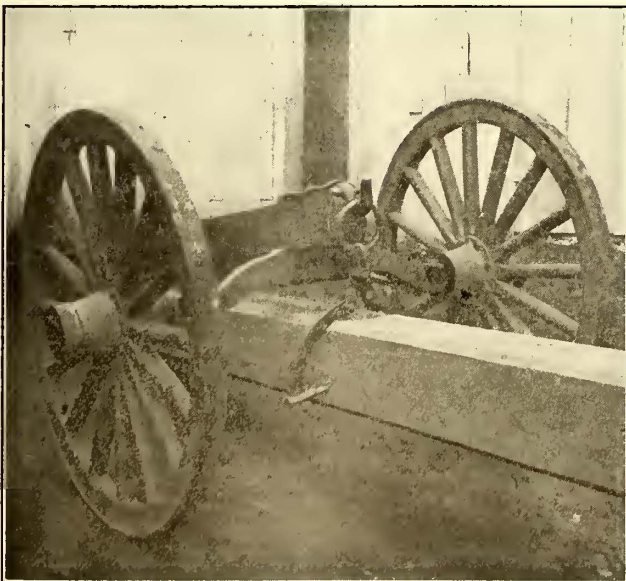
On steep side-hill work this method of distribution is preferable to the use of a large six-horse team, hauling several poles at a time and requiring the services of a big crew of men taken from the hole digging to load and unload the wagon. The wagon and gig plan carries the pole with its center of gravity below the wagon axles and close to the ground. There is less likelihood of this outfit capsizing on uneven side-hill work than when the load is above the axles as with the six-horse team method. In unloading, also, the pole is lowered such a short distance and so gradually that there is practically no danger of it being marred or broken as there is when a pole is lifted up over the wagon wheels and left to roll at random to the ground down skids. When hauling but one pole at a time there is also less liability of the wheels getting stuck in soft ground than when hauling many poles on a large wagon.

On account of complaints from blockading of exits to driveways, from people falling over poles in the dark, etc., it has been found better only to distribute poles enough for the day's work and, in some cases, only at the exact rate at which holes are completed. If a six-horse team is used to haul the poles the team is used for only a few hours and is paid for a whole day. With the gig method the poles for the day are distributed at a time when the two-horse team would be idle. While the poles are being set the team is employed in hauling away the surplus excavated material, thus being kept busy all day and eliminating altogether the need for the larger team for pole distribution.

The gig has reduced the cost per pole for distribution enough to repay its cost several times over.

The pole in the illustration is only a short piece used to show the grip of the tongs, no long pole being convenient.

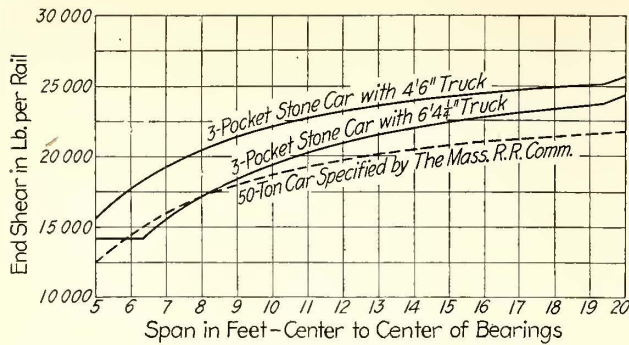
Hot floor oil as a paint substitute for the floors and platforms of the cars of the Evanston (Ill.) Railway has been found to give very satisfactory results after two years of experimentation. Hard maple floors are treated on both sides with a hot oil which does not mar or show service wear like the ordinary floor paints. In addition the oil waterproofs the floor, increases its wear life and need not be applied as often as paint.



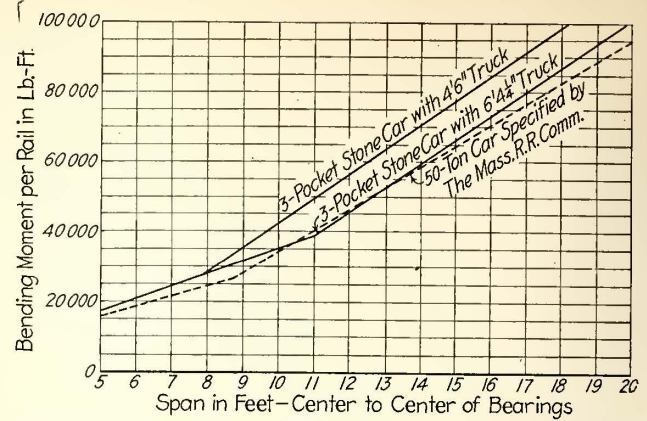
DISTRIBUTING LONG POLES—POLE IN PLACE IN GIG



DISTRIBUTING LONG POLES—POLE TONGS



COMPARATIVE SHEARING STRESSES FOR CARS OF DIFFERENT WEIGHTS AND WHEELBASE



COMPARATIVE BENDING STRESSES FOR CARS OF DIFFERENT WEIGHTS AND WHEELBASE

Connecticut Company Bridge Records

BY W. R. DUNHAM, JR.,

Engineer Maintenance of Way Connecticut Company, New Haven, Conn.

The Connecticut Company operates 700 miles of track, and in this mileage there are 351 bridges. These include all openings of 10-ft. span or greater and are listed and numbered by divisions, each division being indicated by the first, or first and second, numeral. For example, Bridge No. 1015 is No. 15 on Division 10.

The divisions are numbered from the westerly end of the system, which runs nearly east and west, with two branches from the east end northerly. No distinction is made in the numbers between railway bridges and highway bridges occupied by company tracks.

In 1907 the first detailed inspection of all bridges over which this company operates was made, and in considering whether to strengthen old structures or build new a type of car similar to that specified by the Massachusetts Railroad Commission was used, viz.: a car 50 ft. over all with two trucks spaced 25 ft. between centers, wheelbase 5 ft. and total load 50 tons. Bridges are being gradually strengthened for this loading. There are, however, a number which have not been strengthened. In some cases the weight of the cars operated over them does not exceed 36 tons, and as the cost is too great to warrant strengthening them for the infrequent movement of the 50-ton cars these are not allowed to be routed across the light bridges.

For handy reference a digest of this report was made and filed in a loose-leaf binder, showing division, bridge number, location, type of bridge (whether highway or railway), span, capacity of truss or girder (if a high-

way bridge, capacity is given with and without highway load), capacity of floor beams and stringers, limiting features, limiting load and, at the bottom of the sheet, any restraining orders issued to govern loads or operation across the bridge. This allowed one sheet, reproduced herewith, for each bridge. The digest and the diagrams referred to later were made in duplicate, one for the general manager's use and one for the engineering department. The diagrams are revised semi-annually.

In 1913-1914 a complete inspection of all the bridges was again made and a comprehensive report submitted. The same type of car was used for computing stresses, all other loadings being compared with these stresses. For highway bridges an assumed load of 100 lb. per square foot, in addition to the railway loading, was used.

In addition to this digest of the bridge engineer's report there is also a set of diagram sheets, two for each division, one showing the location of all bridges on that division by diagram, together with the number and a distinctive color to indicate the capacity of the bridge. The second sheet shows the bridge numbers, type and location. These diagrams enable the general manager to decide as to the bridge capacities of the various routes on all divisions.

Since there are various types of equipment in use by the company there are various loadings to be considered. All bridges are not of sufficient capacity to carry the heaviest types. By noting from the digest what particular feature limits the operation, the general manager can decide whether the expense of strengthening a certain bridge is warranted and judge the approximate cost. If the business contemplated warrants further investigation, he can ask for detailed plans and estimates. If trusses and floor beams, as well as stringers, are weak, a proposition for handling freight on a certain line might not be worth considering, as a heavy cost for strengthening would be indicated, while if stringers or floor-beam connections were the only weak features, a more careful investigation as to the cost would be made, as the cost of strengthening would probably be small. The general manager can also tell at a glance what, if any, restraining orders have been issued. Copies of restraining orders are sent to the engineering department when issued and noted on the sheets, the engineering department in turn notifying the general manager's office of the necessity for issuing such orders.

In connection with the trolley express business, in 1914 there arose the necessity for providing a service to handle broken stone, and a dump-car equipment was purchased with a capacity bringing the total load up

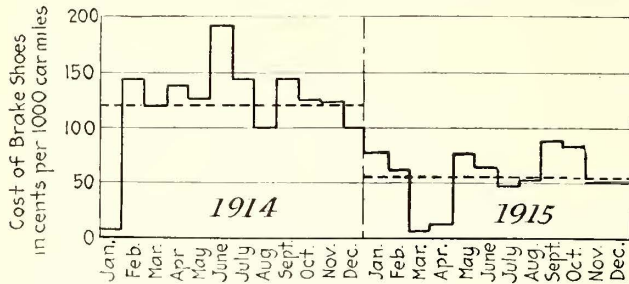
C. M. 19

DIVISION:		
Location and Type:		
Clear Span:	Panel Length:	
	Over-All	
Limiting Features:		
Limiting Load		
Members	100# per sq. ft. and	Car Alone
Truss or Girder		
Floorbeams		
Stringers		
Remarks:		

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by excessive coasting during March and April, but when the time element was added to the motormen's delay record, as described above, this variety of lost time disappeared. The elimination of this abnormal coasting and the increased work caused the kilowatt-hours per car-mile to rise during April and May, 1915.

On another accompanying graph it will be noted that the work done, as indicated in stops per mile, has



METERS ON SHORT LINE—GRAPHICAL RECORD OF UNIT BRAKE-SHOE COST

steadily increased since January, 1914. Therefore the saving in energy in 1915 over that for 1914 has been made in the face of increased stops.

The following table shows the energy consumption per car-mile for two years past:

Month	1914, Kilowatt-Hours per Car-Mile	1915, Kilowatt-Hours per Car-Mile
January	4.6	4.2
February	4.7	3.6
March	4.5	3.5
April	4.5	3.5
May	4.4	3.7
June	4.3	4.1
July	4.1	4.0
August	4.0	4.0
September	4.1	4.0
October	4.2	3.9
November	4.3	3.9
December	4.3	4.0
Average	4.6	3.9

The saving per car-mile was 0.47 kw.-hr. or 10.8 per cent for 1915 over 1914.

The energy saving for one year was \$2,893.26, so that deducting \$400, the cost of the meters and installation, there was a net saving of \$2,493.26. No help was added to care for the records, the work being done by an office clerk in about one hour each day. The meters have not cost 1 cent for maintenance during the first year, but are being cleaned and inspected now in preparation for the coming year. A representative of the manufacturer visited the property and instructed one of the shop men in the method of taking care of the meters. The work is very simple and the average shop man can easily make the repairs.

The meters are placed in the cabs in plain view of the motorman, and this fact gives a means of knowing just what the energy consumption is between any two points desired.

In order to show the consumption of brakeshoes during the years 1914 and 1915, a third graph has been reproduced. The high average for 1914 was caused in part by some faulty brake conditions. However, the similarity between this brakeshoe graph and the graph of energy consumption per car-mile proves that a material reduction in brakeshoe wear resulted from increased coasting. The saving indicated is about 50 per cent. Of this amount we estimate that 20 per cent is due to improvement in braking conditions, and 30 per cent to coasting. This saving would represent approximately \$257 in brakeshoes. Therefore, the net saving in energy and brakeshoes for one year was \$2,750.

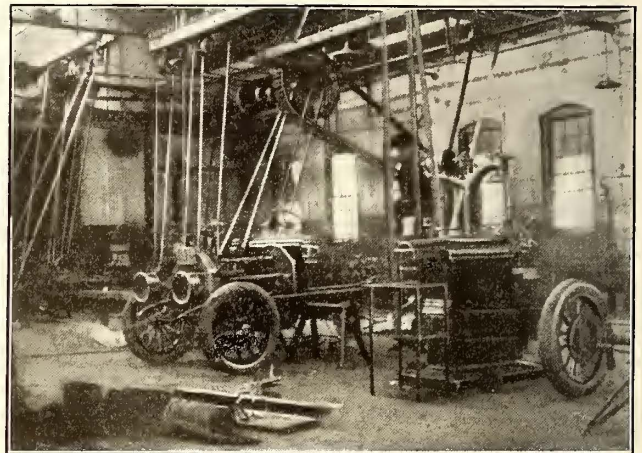
The instruction of motormen is carried on by the assistant trainmaster, and on a road of this size does

not consume a great deal of time. The record of stops is obtained from conductors' ticket reports, and these include special stops for non-revenue passengers, waiting for targets, etc.

In summing up it can be stated after one year of operation that the motormen are practically as much interested in the results as they were at the beginning, and that it has been proved that a very substantial saving can be made by coasting even with a high schedule speed. We believe that the ampere-hour meter is a very effective and economical instrument with which to check operation.

Repairing Damaged Automobiles Saves 100 Per Cent

Since Jan. 1, 1916, the Memphis (Tenn.) Street Railway has repaired six privately-owned automobiles which had been damaged by its cars, and effected a saving of 100 per cent over the cost of having the same work done by others. According to the new plan all damaged automobiles are brought into the railway company's shop, where they are repaired by the regular shop force. No particular difficulty was experienced in

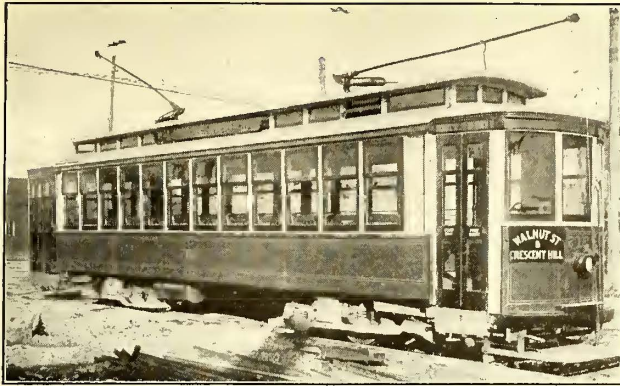


REPAIRING DAMAGED AUTOMOBILE IN MEMPHIS RAILWAY SHOP

breaking in the repairmen to do this class of work, because they had become more or less familiar with it through making repairs to the company's automobile service equipment. On the other hand, the addition of this work to that of handling car repairs has made it possible to keep more skilled mechanics on hand for other emergencies. A general view of the repair shop with an automobile undergoing repairs is shown in the accompanying illustration.

Yellow Pine Specifications

A bulletin containing the 1915 standard specifications for grades of yellow pine lumber has been issued by the Southern Pine Association, New Orleans, La. The information and data contained in the bulletin embody substantially the specifications for yellow pine lumber recognized generally by the lumber trade for many years. Grading rules are given which classify in detail all of the recognized defects in yellow pine, such as knots, knotholes, splits, shake, wane, red, hearts, pits, rots, rotten streaks, wormholes, pitch, pitch pockets, torn grain, loosened grain, seasoning checks, sap stains, and defects in manufacturing. The bulletin also contains a thorough description, accompanied by reproductions from drawings showing the standard sizes and dimensions of yellow pine flooring, siding, partitions and ceilings.



EXTERIOR OF REBUILT SUMMER CAR

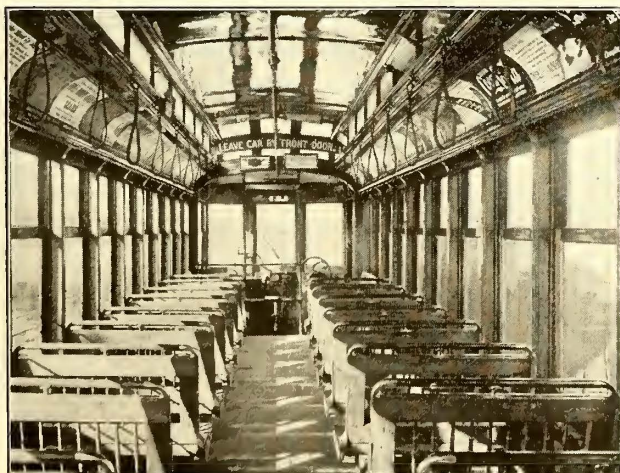
Louisville Railway Reconstructs Summer Cars for Winter Use

The Louisville (Ky.) Railway, as an experiment, has recently converted one of its open summer cars into an inclosed all-the-year-round car, the design of which has proved so satisfactory that the company will soon take steps to convert all of its summer cars in a similar manner. The experiment was made in order to utilize the idle summer equipment during the winter months, and to reduce the frequency of accidents due to persons jumping on and off the running boards of open cars while they are in motion.

The reconstructed car, which is now in operation on the Walnut Street and Crescent Hill line, was turned out at the Louisville Railway's shops at Twenty-ninth Street and Garland Avenue. It is 44 ft. long and 7 ft. 7 in. wide, the car body being 33 ft. long. It has no bulkheads. It is equipped with folding doors, differing in this detail from the company's other closed cars in that they have the safety gates. This arrangement is made necessary by the omission of bulkheads. The windows on this car raise, while the windows on the other closed cars drop. There are twelve windows on each side.

The conductor is separated from the passengers by an iron rail, and controls the entrance, rear exit and rear folding step. The folding exit door and step in the front platform are controlled by the motorman.

The converted car has a seating capacity of forty-five. The summer car seats have been utilized, there being seventeen cross-seats on each side of a 23-in. aisle, and longitudinal seats at each end, each of which seats three passengers with the exception of



INTERIOR OF REBUILT SUMMER CAR

the one in front on the right, which seats two. The car is equipped with maximum traction trucks, and Westinghouse No. 56 motors. Gold heaters, which the company has been using for some years in its closed cars, are also used in the reconstructed cars.

It is estimated by John Zoll, master mechanic of the company, that with the material on hand it will be possible to convert three, and possibly four, of the summer cars a week. Thomas H. Minary, assistant to the general manager, was in charge of the work of converting the experimental car, and will direct the work of converting the remainder of the company's rolling stock.

Mechanical Joints Cost More than Welded

During the past two or three seasons the Louisville (Ky.) Railway's track department has been substituting electrically-welded joints for continuous joints and, at the same time, has effected a saving of 50 per cent exclusive of the energy charge. Standard channel splice bars were purchased with 7-in. girder grooved or standard section rail and at the same tonnage price. These plates were delivered to a machine shop, where the ends were cut to approximately a 45-deg. angle with the narrow side of the trapezoid thus formed at the top of the plate. The cuts on the two plates were made so that when they were bolted to the rail they would not come exactly opposite on the web. This was done to relieve internal strains in the web, which sometimes develop when the welds of the two plates are made exactly opposite on the rail web.

Preparatory to welding the ends and the bottom of the plate along the base of the rail, the splice bars were bolted in place, just as though a mechanical joint was to be made. The plates were then welded to the web and the base of the rail, and the nuts were spot welded to the bolts. More than 1000 joints of this type have been installed and satisfactory results have been obtained in every instance. In other words, no break-ages have occurred in service, although some of the joints have been in the track for more than a year. Comparative costs of the welded and bolted joints show that the former is much cheaper. The comparison which follows, is made on the basis of bolted continuous joints applied to a Lorain section 103-478, which is a 7-in. grooved girder rail.

COST OF MATERIAL AND LABOR FOR A BOLTED JOINT

One pair eight-hole patented mechanical joints complete with bolts and nutlocks	\$4.75
Two 10-in. Fig. 8 copper bonds .....	.76
Labor applying joints .....	.16
Total cost	\$5.69

COST OF MATERIAL AND LABOR FOR WELDED SPLICE BAR

One pair eight-hole splice bars complete with bolts	\$2.07
5 lb. welding steel at 5 cents per pound .....	.25
Labor welding splices .....	.42
Labor putting up a pair of joints .....	.18
Total cost	\$2.92

All scrap motor brushes are brought into the store room of the Louisville & Northern Railway & Lighting Company, New Albany, Ind., where they are cut to the correct sizes for various types of air compressors. A jig fitted with a hand saw is provided for this purpose, and as a result of the adoption of this practice the company has bought no new carbon brushes for its air compressors for some time. The shop storekeeper cuts up the old motor brushes during spare time, and it has been found that he can saw \$3 worth of brushes for approximately 50 cents.

NEWS OF ELECTRIC RAILWAYS

SLOW PROGRESS IN NEW YORK INQUIRY

Resignation of Commission Counsel and Holiday Retard Inquiry—Suits to Establish Validity of Contracts.

The hearing before the Thompson legislative investigation committee in New York continued on Feb. 18 with Theodore P. Shonts, president of the Interborough Rapid Transit Company, as the witness. Some letters from Mr. Shonts to the late Andrew Freedman, a director of the company, were read, but brought out no new essential facts.

On Feb. 19 Mr. Shonts testified that when he told the late Gardiner M. Lane of Boston, then an Interborough director, that he wanted the contract for third-tracking and extending the elevated lines to go to John F. Stevens to pay off "certain commitments and obligations," he meant that he had committed and obligated himself to do all he could to see that the contract went to Mr. Stevens. The phrase, Mr. Shonts insisted, had no reference to the dual subway contracts. It was simply carrying out his long-established policy that, price and quality being equal, he felt at liberty to do a favor for a friend. Mr. Shonts said that he had no explanation to give as to why Mr. Lane and William A. Read resigned from the directorate of the company soon afterward or why Mr. Young was not re-elected.

On Feb. 20 Bainbridge Colby resigned as counsel to the committee, giving as his reason "the disposition of the chairman of the committee to take the examination out of the hands of counsel as soon as he apprehended its drift and to substitute unconsidered and wholly impulsive examination for that which counsel had in mind based upon a careful review of evidence in the committee's possession." The committee promptly appointed Frank Moss as chief counsel, despite the fact that Mr. Moss also is counsel for Robert Colgate Wood, formerly a member of the Public Service Commission, who is now facing trial under a charge of having solicited a bribe. This change delayed the progress of the examination and little was done on Feb. 21 in the way of direct questioning of witnesses. There was no formal session of the committee on Feb. 22, which was a holiday in New York State.

Answering certain questions put to him in an open letter by Senator Charles C. Lockwood of Brooklyn, in order to test his fitness for a public service commissionership, Travis H. Whitney, secretary of the commission, on Feb. 21 gave some interesting facts to the daily press. He denied that the bonuses paid to Theodore P. Shonts, president of the Interborough Rapid Transit Company, and Timothy S. Williams, president of the Brooklyn Rapid Transit Company, and the fees of the outside counsel employed by the Interborough were added to the subway construction account. Speaking of the Shonts bonus Mr. Whitney pointed out that under the "prior determination of cost" of the dual system, the Interborough was to receive \$125,000 as an apportionment of the sum of \$1,532,000 expended for salaries and expenses of its administrative officers during the negotiations. It might be, said Mr. Whitney, that this allowance was paid by the Interborough as a bonus to Mr. Shonts, but the commission did not know of it or even that Mr. Shonts was to get a bonus. It did not affect the apportionment to the company. Mr. Whitney knew nothing about the \$100,000 voted to Colonel Williams.

In relation to the injunction suit brought by the Admiral Realty Company against the city, which now appears to have been financially assisted by the Interborough, Mr. Whitney said that the connection of the Interborough was suspected in the same way as it was supposed that the Brooklyn Rapid Transit Company instigated the similar Ryan suit. He pointed out, however, that these were consolidated with the J. J. Hopper suit presented by Clarence J. Shearn, and that that was undoubtedly a bona fide litigation. The payments to the counsel representing the Admiral Realty Company, Mr. Whitney asserted, would be charged in no way against the cost of construction of the new subways.

So he also denied that any heavy legal expenses were to be charged by the Interborough against the contract. Its account for lawyers during several years of negotiation amounted to \$65,000, and did not include the fees to Francis Lynde Stetson, Morgan J. O'Brien, Winthrop & Stimson, Untermyer & Marshall and Hays, Hershfield & Wolf.

After asserting that the evidence before the Thompson committee showed that the accounts of the traction companies were looked into with great strictness by the commission, Mr. Whitney, replying to questions concerning the Fourth Avenue subway signal contract, said his part in its negotiation as secretary was only in conferences. As it was handled directly by the commissioner, the counsel and chief engineer, he had officially no right to approve or disapprove of it. Mr. Whitney did not approve of the method followed in awarding that contract. In the same way Mr. Whitney asserted that he did not approve the letting of the contracts for the third-tracking of the Manhattan elevated lines on the percentage basis. As for the Brooklyn third-tracking, he said his views were so favorable to the plan put forward the committee of 100 had printed and distributed what was known as the Whitney-Harkness report against the Fulton Street third tracks.

On Feb. 23 the committee again went into the three taxpayers' suits referred to by Mr. Whitney in his statement. The same legal point was involved in all of these suits and for convenience they were consolidated. The point at issue in the suits was whether the city had a right to become a partner in a private enterprise. The case went from the Supreme Court to the Appellate Division and to the Court of Appeals. It has already been established that J. P. Morgan & Company refused to finance the Interborough Rapid Transit Company in carrying out the subway contracts until the courts had passed upon their validity. Earlier in the day Bainbridge Colby, former counsel to the committee, went on the stand and said he had received a message from George W. Young, former Interborough director, who was on his way to Palm Beach, Fla., and that Mr. Young had expressed his willingness to return at any time and go before the committee. Senator Thompson sent word asking him to appear on Feb. 26.

PRESIDENT KING TALKS ON CONSOLIDATION

Employing the text "Let's Talk It Over and Be Fair About It," Clarence P. King, president of the Washington Railway & Electric Company, Washington, D. C., in an informal talk on Feb. 19, before the Federation of Citizens' Associations on public utility questions, sounded the keynote of a campaign to be immediately launched by that body for greater co-operation between citizens and the utility corporations in improving the services furnished by them.

Mr. King referred briefly to some of the methods that might be employed for relieving congestion on the traction lines. Abolishment of compulsory fire stops, establishment of skip stops during the rush hours, readjustment of express service and other features were touched upon. Most significant of his statements, however, was the declaration that the basis of future development of Washington's street railway lines must be the consolidation of all the traction lines and the electric power company operating in the District. He declared that consolidation offered the only means of financing extensions and rearranging trackage so as to meet the traffic problems of the future. Mr. King stated that the consolidation project had been recommended to Congress by a former board of commissioners, and that it offered the only feasible solution of the vital problems of the local traction situation.

The committee, by a unanimous vote, was instructed to confer not only with Mr. King, but with the heads of other local public service corporations, and to submit a program of co-operation which, if popularly subscribed to, will lead to improvements in service that ordinarily would be sought by administrative and legislative means.

BEMIS DALLAS REPORT PRESENTED**Complete Report Not Yet Ready—Summary of New Franchise Provisions—Utilities Consider Proposed Terms Unreasonable**

Recommendations for the solution of the traction and electric lighting situation in the city of Dallas, Tex., were filed with the Board of City Commissioners on Saturday, Feb. 19, by Edward W. Bemis, economist and public utility expert, who had been employed by the city to analyze the situation and present recommendations for a new ordinance and new franchises to the traction and electric lighting companies. The report was promptly adopted by the Board of City Commissioners and the proposed franchises were as promptly rejected by Stone & Webster, owners of the properties. Stone & Webster were represented during the negotiations by Russell Robb, a partner in the firm, who has been in Dallas from Boston for several weeks studying the situation and giving information to Mr. Bemis.

Following rejection of the "model franchise," proposed as a result of the investigations conducted by Mr. Bemis, it was announced by the administration that a charter amendment embodying the adoption of the franchise would be submitted to a vote of the people at the city election on April 4, that the city would seek to condemn the present Stone & Webster franchises if the company does not change its mind and adopt the franchise offered, and that the franchise then would be granted to some other corporation. The franchise proposed embodied the following ideas:

The street railways east of the river should be capitalized at \$3,500,000, upon which the company would be allowed to earn a maximum of 6 per cent net per annum.

The electric lighting property should be capitalized at \$3,600,000, upon which the company would be allowed to earn 7 per cent net annually, maximum.

Electric light rates should be reduced to a figure not determined definitely, but which would not be more than 8 cents per kilowatt-hour as against 10 cents per kilowatt-hour, as at present.

All revenues above operating expenses and allowed net earnings should be devoted to reduction in fares and light rates.

Complete rehabilitation of the street car lines and the electric light plant and extensions of service of both.

The franchise to be determinate for ten years only. After that period the city either would have the right to take over for itself or some corporation offering better terms both the street railway and lighting systems, upon payment of a stipulated sum.

Appointment of a public supervisor to represent both the interests of the investors in the properties and of the citizens of Dallas, the supervisor to have jurisdiction in ordering improvement of service and equipment.

Arbitration of differences between the public utilities company and the city.

The proposals were rejected by Stone & Webster on the ground that the capitalization and rate of income proposed are both too low. They claimed a value of \$5,000,000 each on the light plant and the traction lines east of the river, an aggregate of \$10,000,000, and wanted to be allowed to earn 8 per cent upon this capitalization. Last year the light plant cleared \$520,000, a return of more than 10 per cent of its value as figured by Stone & Webster. The street railway system was operated at a profit in 1914, but not last year because of the operation of the jitneys. As a general proposition, from year to year, it has not paid large returns.

Allowing the earning rates of 6 per cent and 7 per cent respectively for the street railways and lighting systems, the model ordinance would provide that the earnings would be cumulative not to exceed 1 per cent in any one year. That is, if the street railway company, for example, should earn only 3 per cent one year and 9 per cent the next, it could make up but 1 per cent of the first year's deficit out of the surplus of the second year. There would be provided under the model franchise, however, an interest fund of \$150,000 for each utility. When this fund grew to as much as \$200,000, rates automatically would go down. When the fund sank to less than \$100,000 they would go up.

To start with, street cars would be allowed a 5-cent cash

fare, as the second step in reduction they would sell six tickets for 25 cents, with a universal transfer. The rate would not be changed in less than three years in order to provide funds for building up the plant and improving service. The next steps in fare reduction would work automatically. As profits of the company increased, rates would go down. If profits decreased rates would go up. But always there would be the universal transfer feature.

A formal report has not been filed yet by Mr. Bemis. He worked out the valuations and turned them over to the board at once, and his typewritten report will be submitted within ten days.

City Attorney Charles F. O'Donnell will begin at once to draft the proposed charter amendment and also the franchise ordinance which the board seeks to have accepted.

Following the conference with the Board of City Commissioners and the formal rejection of the proposition submitted by the city on the report of Mr. Bemis, Charles F. Wallace, president of the Dallas Electric Light & Power Company, gave out a statement in part as follows:

"The total actual investment in the street railways as of Sept. 30, 1915, the date to which the examination of Mr. Bemis extended, was \$5,300,000. Mr. Bemis proposes that these properties be valued at \$3,500,000, a loss to investors of \$1,800,000, and that earnings be limited to 6 per cent on this reduced valuation.

"The total actual investment in the lighting company property as of the same date was \$4,400,000. Mr. Bemis proposes a valuation on this property of \$3,500,000, a loss to investors of \$900,000, and that the return on this reduced valuation be limited to 7 per cent.

"The city's plan would require the railway companies to make an additional investment for additions, extensions and improvements of about \$750,000, and would require the lighting company to make an additional investment of about \$1,500,000, including the completion of the underground work. The companies would be willing to make these improvements if placed in a position to finance them.

"The city further proposed a reduction in street railway fares which would cost, according to the companies' estimates, a loss in earnings of 12 per cent to 15 per cent. This reduction, if applied to the year 1915 gross earnings on the basis of 12 per cent would have left only \$29,444 with which to take care of interest, dividends and depreciation, after paying ordinary operating expenses and maintenance, or less than 1 per cent even at Mr. Bemis' valuation.

"Under the proposed plan, therefore, the owners of these properties would have available as a return on their existing total investment of \$9,700,000, and as a basis for financing the additions and improvements required by the city, only the allowed earnings from the lighting company of 7 per cent on \$3,500,000. The impossibility of raising money under these conditions is apparent.

"In other words, the situation, difficult as it has been in the past, would be impossible for the future, and the companies were compelled to state frankly to the Board of Commissioners that the plan proposed would mean ruin to the properties, serious loss to the investors and disappointment to the citizens of Dallas. It is impossible for the companies to work out the situation or to improve it under the proposed plan."

CHICAGO TRACTION COMMISSION HOLDS HEARINGS

General information concerning the Chicago traction situation is being obtained by the new Chicago Traction & Subway Commission through public hearings. Three hearings were held during the week beginning Feb. 13, and others will be held later. Civic organizations, clubs and others interested in the betterment of Chicago's local transportation facilities were invited to these meetings to express themselves concerning local transportation questions. At one of the meetings the attorney for the Cook County Real Estate Board stated that the payment of 55 per cent of the net earnings of the street railways to the city was undesirable. A more satisfactory plan would be to spend this money for improving service. Henry M. Brinckerhoff has been appointed chief engineer of the commission as noted on page 426 of this issue.

ANOTHER RAPID TRANSIT PROPOSAL IN CINCINNATI

M. E. Springer, an engineer at Cincinnati, Ohio, on Feb. 9 made public a comprehensive plan for a combination steam and electric belt line about that city and union stations for steam and interurban roads. The proposed belt line would touch all the industrial districts and most of the residence suburbs, circling the city somewhat similarly to the proposed municipal loop. The union station for the steam roads would be located at Court, Plum and Canal Streets, with the interurban terminal just to the south of it and separate terminal conveniences for steam and interurban roads. The plan will soon be presented to the various railroads for their consideration.

E. W. Edwards, chairman of the rapid transit commission, said on Feb. 10 that the plan seemed good for the entrance of the railroads, especially those from the West, but he doubted the feasibility of electrifying any portion of the terminals and the joint terminals. He advised that this plan and that of the municipal loop be kept separate, so that there will be no confusion when the people are called upon to decide the question of a bond issue in April. On the other hand, William Rheel, president of the Cincinnati Real Estate Exchange, favored the plan because the people would not be called upon to finance the construction through a bond issue.

The street railway committee of the City Council considered on Feb. 11 the franchise asked by the West End Rapid Transit Company. Residents of Price Hill, who objected to the grant on the ground that it might prevent their securing an elevated structure in the future, were asked to submit a plan considered satisfactory to them.

KANSAS CITY COMPANY STATES ITS PURPOSES

New Company in Kansas City Issues Through Its President Statement to the Public

Philip J. Kealy, president of the Kansas City (Mo.) Railways, on Feb. 15 issued a statement to the people of Kansas City, outlining the policy of the company, indicating the partnership of the city in the street railway, and suggesting the mutual advantage of co-operation for the best service. The statement follows in part:

"Ownership of the street railway lines passed to the Kansas City Railways Company to-day. Under the ordinance of July 7, 1914, this company takes charge with the city as partner. It means a new order in Kansas City street railway affairs, built upon the recognition of mutual interests of the city and the company in the operation of the company. There will be no dodging of issues, no quibbling over demands or orders of the Missouri or the Kansas Public Service Commissions as to service.

"To that end as rapid and as adequate schedules as it is possible to maintain will be inaugurated, particularly during the rush hours. This means more cars. Additional cars of the type recently installed will be placed in service as rapidly as possible. Improved power equipment will be procured.

"Every pledge or agreement contained in the ordinance will be kept. Political influence will not be resorted to in an attempt to secure concessions or to escape the fulfillment of contractual obligations. This institution will not be a political institution. It has no place in politics. Its interest lies wholly in the upbuilding of Kansas City. As the city expands, so is it planned to expand the railway system.

"Of that which is history in street railway affairs this new company had naught to do. Situations arose upon which men justly agreed and disagreed. But they are of the past. Surely, resentment because of them cannot be cherished against the incoming management. Such conditions shall not arise under the present control, which will regard every person in Kansas City as friendly and refuse to believe otherwise until the contrary has been proved.

"The management wants the co-operation of the press, the business interests through the Commercial Club, the Police Department and the people as a whole in an effort to make the Kansas City street railway system the best in the land. As time goes on this co-operation will be sought in more detailed ways."

BUS SERVICE ESTABLISHED IN NEW ROCHELLE

Motor-bus operation at a 5-cent fare in New Rochelle, N. Y., began on Saturday, Feb. 19, this being the first bus line introduced under the provisions of the Thompson bill in the State of New York as outlined in the *ELECTRIC RAILWAY JOURNAL* for Oct. 30, 1915, page 929. Four buses are in service on two routes which are partly competitive with parallel lines of the local electric railway company, and a ten-minute service on regular schedule is given from 7 a. m. to 1.30 a. m. The buses seat about fifteen passengers on longitudinal seats, and are provided with front entrances, having folding doors that are operated by the driver. The pay-as-you-enter system of fare collection is employed and non-registering fare boxes are used. A novelty appears in the change-making system. Each driver is provided with a number of small envelopes containing change for dimes and quarters, and one or more of these is handed to any entering passenger who offers such a coin in payment for his fare.

As yet the service is very lightly patronized, but this is no doubt due to the lack of general knowledge that the buses are finally in service, the commencement of operations having been very much delayed beyond the time originally set. On the other hand, complaints have already been made regarding the great height of the bus floors, the extreme swaying and jouncing of the light body, and the discomfort of the narrow longitudinal seats. Nevertheless, the opening of the service meets with great favor by residents along certain portions of the route that are at considerable distances from the electric railway line. Some of them state that the bus service saves them as much as fifteen minutes in their daily trips to and from the railroad station, the bus routes passing through districts occupied altogether by commuters who travel daily to New York City, of which New Rochelle is really a suburb. Both routes pass gasoline filling stations on which are prominently displayed signs reading, "Gasoline 24 cents," and this may be acting as a deterrent among patrons, to some of whom the privilege has been extended of subscribing at par to the stock of the company.

CLEVELAND COMMISSIONER OPPOSED TO STOPPING INTERURBANS AT CITY LIMITS

Fielder Sanders, street railway commissioner of Cleveland, Ohio, has reported to the Council of Cleveland in accordance with the resolution on the advisability of the Council taking steps to cause interurban cars to terminate at the city limits. Mr. Sanders said in part:

"In my judgment such action would be wholly inadvisable. It is a matter of common knowledge that the interurban railway system has been of tremendous advantage in building up the city of Cleveland and the suburbs surrounding. I know of no cities in the United States with the exception of Cincinnati and Chicago in which interurban cars are not permitted to come to the center of the business district. In Cincinnati, four lines stop at the city limits, but only because of the fact that those lines have a different track gage from the city tracks, and a movement is now on foot in Cincinnati to devise plans for an interurban central terminal station.

"To forbid the entrance of the interurbans would restrict the growth of the city and the growth of its business, by making ingress necessarily more difficult. In the same way it would restrict egress both of strangers and citizens, making it difficult to know what city car connects with the interurban car that the traveler wishes to get at the city limits.

"It would, in my mind, have an inevitable tendency to keep people out of the city by effectively erecting a wall around the town. The chief drawback to the present system is the fact that all the interurbans converge in the Public Square and cause at times great congestion and very frequently interrupt the ordinary operation of the city system. This drawback may, however, be obviated either by rerouting the suburban cars, or, which is the more logical way of solving the problem, by the interurban car lines joining and coming into Cleveland by private right-of-way to a central terminal as is done at Indianapolis. The Council should not take the steps contemplated by this resolution."

TRAFFIC COMMISSION FOR TORONTO

On Feb. 7 the Council of Toronto, Ont., approved the principle of the appointment of a traffic commission, which should have absolute control of all transportation matters within the city limits. On Feb. 10 City Solicitor Johnston advised the Board of Control that special legislation or the consent of the people would have to be secured before the proposed commission could even supervise the working of the civic car lines. Mr. Johnston said that under the provisions of the public utilities act the consent of the people must be obtained before a municipal body could delegate its powers to a subordinate organization. Mayor Church said that while the city solicitor was correct in his interpretation of the law, there was nothing to prevent the city making application to the Legislature for an amendment to the act to enable it to appoint a commission and to confer upon the commissioners all the powers now enjoyed by the municipality. He said that it was essential if the city was to be developed that it should own and control the means of transportation.

CIVIC FEDERATION PRESENTS MINIMUM WAGE REPORT

A year ago the minimum wage commission of the National Civic Federation entered upon an inquiry into the minimum wage question. The commission inquired into conditions in the eleven states in the country where such laws already are in force. It has just completed its investigation and it recommends:

1. That Congress pass a resolution directing a joint investigation by the Department of Labor and the Department of Commerce, which shall be provided with money enough to make the inquiry a thorough one.

2. That some means be devised for determining what is a fair day's work before standards be set up for a fair day's pay. At present, the commission finds there is no knowing what a fair day's work is. Some unbiased, unprejudiced agency, therefore, is recommended that will enable the employer to know what "he is to get" for his money and what the employee "will have to give."

CINCINNATI BELT LINE PLANS PRESENTED

M. E. Springer formally presented his combined steam and electric belt line plans to the Rapid Transit Company of Cincinnati, Ohio, on Feb. 18. He explained the advantages he believes the plan has over the proposed municipal loop. The main idea is that in combining the two on the same route, he will not only give the interurban railways an entrance to the business section of the city, but in addition will furnish a commercial belt line for the steam roads that will be invaluable in the development of the manufacturing and wholesale business of the city.

Members of the commission questioned Mr. Springer closely on a number of points. Mayor Puchta said he would not favor placing anything in the way of the bond issue that is to be placed before the people in April, but if the Springer plan has special merit it can be taken up afterward. Further conferences are to be held, at which engineers representing Mr. Springer, the railroads and the Rapid Transit Commission will be present.

CLEVELAND TRACK CONSTRUCTION APPROVED

The Council of Cleveland, Ohio, on Feb. 21 acted favorably on the Cleveland Railway's application for authority to relay tracks on Cedar Avenue and Broadway and make other track improvements, all at an estimated cost of \$905,427. Fielder Sanders, street railway commissioner, outlined the position of his department. He said that he will strive to reduce the present fare. He said further that his force will be detailed to learn the cause of the deficit of \$590,000 in the company's maintenance fund.

M. F. Bramley became plaintiff on Feb. 19 in a second suit to prevent the construction of subway approaches to the new Detroit-Superior bridge across the Cuyahoga River. He seeks to enjoin the city officials from entering into a contract that will give the county the right to tear up the city streets.

WAGE INCREASE GRANTED IN DETROIT

A new wage agreement has been entered into between the Detroit (Mich.) United Railway and its motormen and conductors, following a series of conferences attended by officials of the company and representatives of the street car men's associations. The new agreement, which was accepted by the men at a union meeting on Saturday night, Feb. 19, provides for a substantial increase in pay to the employees on both the city and the interurban lines of the system. It is estimated that the increase will cost the company more than \$250,000 yearly. It will affect about 3000 employees.

The agreement provides that all men now paid 25 cents an hour shall be paid 27½ cents an hour, and at the end of a probationary period of three months shall be advanced to 32½ cents an hour. All men now paid 30 cents an hour shall be paid 32 cents an hour, and at the end of nine months 35 cents an hour. All men now paid 32 cents an hour shall be increased to the maximum rate of 35 cents an hour. All men entering the service after Feb. 16 shall be paid: First six months, 27½ cents an hour; next twelve months, 32½ cents an hour; thereafter, 35 cents an hour.

Under the new arrangement passenger car men are privileged to apply for freight, milk, express and mail runs when vacancies exist, assignment to be according to seniority.

Short Norfolk & Western Electric Extension Proposed.—Plans for an extension of the Norfolk & Western electric zone have been authorized, the new electrified track reaching the town of Pocahontas, west of Nemours on the present electrified section of the main line. The extension will cover approximately 3 route miles.

Question as to What Constitutes Construction.—Mayor Harry E. Davis of Cleveland, Ohio, has asked the director of law for a ruling as to whether the relocation of water mains for a short distance in Euclid Avenue constitutes an act of beginning work on the proposed subway by the Cleveland Rapid Transit Railway.

Commissioner Sanders Plans for Relief from Congestion.—At a meeting with several members of Council recently, Fielder Sanders, street railway commissioner of Cleveland, Ohio, suggested as a means of relieving congestion in the Public Square four-track loops, overhead passageways to the tracks and loading platforms between the tracks. Mr. Sanders advanced this plan as a temporary measure until underground terminals can be built, but it would undoubtedly meet with opposition from many Councilmen as well as the city plan commission, because of the appearance it would give the square.

Reduction in Cleveland Valuation Refused.—The Ohio State Tax Commission, on Feb. 16, refused to reduce the valuation of real estate used in the operation of the Cleveland Railway from the figures fixed by former County Tax Commissioners Fackler and Agnew. For the year 1915 the commissioners added \$308,000 over the previous year, making the value \$1,280,000. They did, however, allow a reduction on the real estate not used in the operation of the road. Officials of the company contended that the increased valuation on its property is not fair, because three utility corporations are the only interests affected, the commissioners having failed to complete a general revaluation of all city property.

Detroiters Urged to Buy Stock.—The stock of the Detroit (Mich.) United Railway has been listed on the Detroit Stock Exchange. Under the caption "How to Become a D. U. R. Stockholder; Buy a Share of Stock" *Electric Railway Service*, published by the railway, said in its issue of Feb. 18: "The Detroit United Railway is owned by its stockholders. These stockholders live in Detroit, New York, Montreal—in fact, they are scattered pretty well over the face of the earth—just as are the stockholders of other large institutions. Any person can become a stockholder and part owner of these properties on purchasing one or more shares of stock. You can purchase a share of stock of the Detroit United Railway just as easily as you can purchase a bushel of potatoes at the corner grocery."

Work on Philadelphia Subway and Elevated to Be Rushed.—William S. Twining, newly appointed director of transit of the city of Philadelphia, Pa., has given out the following statement in reference to the work now being done by the

city: "Satisfactory progress is being made upon the City Hall station section of the Broad Street subway. Thirty-six per cent of the work on the column foundations for the Frankford elevated, from Callowhill to Unity Streets, has been completed and the erection of the steel structure is expected to be started about April 1. Contracts have been executed, with the approval of the Public Service Commission, for the foundations and steel superstructure of the Frankford elevated through the business section of Frankford, Unity Street to Dyre street."

Pacific Claim Agents' Index Bureau Elects Officers.—At a meeting of the board of directors and members of the Pacific Claim Agents' Index Bureau held at Portland, Ore., on Feb. 12, the bureau elected B. F. Boynton, claim agent of the Portland Railway, Light & Power Company, Portland, Ore., president; J. S. Mills, claim agent of the San Francisco-Oakland Terminal Railways, Oakland, Cal., first vice-president; H. G. Winsor, claim agent of the Tacoma Railway & Power Company, Tacoma, Wash., second vice-president; H. K. Relf, claim agent of the Spokane, Portland & Seattle Railway, Portland, Ore., treasurer. The election of all officers, except the president, is to take effect on April 1. The election of the president took effect immediately. The organization has decided to move the index bureau to Portland, Ore., to be permanently located there.

Report on M. I. T. Traffic Research Department.—A reference to the electric railways traffic research department of the Massachusetts Institute of Technology appears in the report of the president of the institute, just issued. It is contained in the statement of the electrical engineering department, contributed by Prof. Dugald C. Jackson, and says: "The electric railway traffic research has been continued in the investigation of changes in receipts, expenses, investment, rate of return, and other factors for a number of street railway companies since the time of their electrification. By gathering a large amount of statistical data of this sort, it is hoped that it will be possible to trace the effects of important changes in operating conditions, and the effect of growth of population and suburban extension of cities upon the finances of the street railway companies in question." The expenses of the department during the past year are shown to have been \$2,192.89.

Fort Smith Voters Ratify Bridge Contract.—At a special election held in Fort Smith, Ark., on Feb. 8 the voters of the city ratified the contract made between the Free Bridge Commission and the Fort Smith Light & Traction Company covering the operation of cars across the bridge over the Arkansas River between Fort Smith and Van Buren. The company agrees to charge a cash fare of 10 cents from any point in Fort Smith to any point in Van Buren, with transfer privileges in either city, and to sell tickets in books of sixteen, eight and four, at \$1, 50 cents and 25 cents respectively. The company also agrees to keep tickets on sale at not less than five places in Van Buren and not less than ten places in Fort Smith. The company is to pay to the Bridge Commission of the Fort Smith and Van Buren district 5 cents out of each 10-cent fare paid and 1½ cents on each ticket. These payments are to be made in full compensation for the use of the bridge and its approaches by the company.

Harbor Commission Promises a Ferry Loop for San Francisco Municipal Cars.—Following the signing of a permanent injunction prohibiting "C" and "D" cars of the municipal railway lines in San Francisco, Cal., from using the ferry loop, a petition was taken before the Board of Harbor Commissioners by representatives of the Municipal Railways, requesting permission to construct and maintain upon the Embarcadero a third loop over which municipal cars might be operated, or if in the opinion of the board an additional loop would interfere with traffic, that the permit under which the United Railroads maintains the outer loop be revoked and the loop be removed by the corporation, in order that the city might replace it with a loop for the operation of municipal cars. The board promised that the municipal cars would be accorded the same privileges as the United Railroads, but final action was delayed until the United Railroads could be notified to have representatives present at the hearing. The United Railroads is using the ferry loops under a month to month agreement, revocable at any time upon thirty days' notice.

Financial and Corporate

ANNUAL REPORT

Capital Traction Company

The statement of income, profit and loss of the Capital Traction Company, Washington, D. C., for the year ended Dec. 31, 1915, follows:

Passenger revenue	\$2,191,492
Mail revenue	443
Total revenue from transportation.....	\$2,191,935
Revenue from operation, other than transportation....	14,558
Railway operating revenue.....	\$2,206,493
Operating expenses:	
Way and structures.....	\$102,631
Equipment	119,817
Power	167,515
Conducting transportation	571,614
Traffic	1,328
General and miscellaneous	189,378
Total	\$1,152,283
Net operating revenue.....	\$1,054,209
Taxes assignable to railway operation.....	135,799
Operating income	\$918,410
Non-operating income	6,532
Gross income	\$924,942
Deductions from gross income:	
Interest on funded debt.....	\$277,640
Interest on unfunded debt.....	2,435
Miscellaneous debits	1,293
Total	\$281,368
Net income	\$643,574
Dividends	600,000
Surplus for year.....	\$43,574
Debit—materials and supplies.....	49
Balance carried to profit and loss.....	\$43,523
Profit and loss credit balance beginning of year.....	151,490
Profit and loss credit balance at end of year.....	\$195,014

The railway operating revenue of this company decreased from \$2,255,992 in 1914 to \$2,206,493 in 1915, an amount of \$49,499 or 2.1 per cent. This was caused by a decrease of \$50,713 or 2.2 per cent in passenger revenue, the mail and other-than-transportation revenues showing small increases. The operating expenses, which in 1915 were 52.22 per cent of the gross operating revenue, increased slightly by \$2,891 or 0.1 per cent, and the net operating revenue, therefore, decreased \$51,591 or 4.6 per cent. The net income after all fixed charges was less by \$53,553 or 7.6 per cent than the 1914 figures. The dividend payment of \$600,000 was a decrease of \$60,000, and after adjustment the profit and loss credit balance at the end of the year was \$195,014, as compared to \$151,490 at the end of 1914.

The decrease in operating revenues was caused by the falling off in passenger receipts during the first eight months of the year, on account of the unrestricted operation of jitneys, the more common use of private automobiles and the general business depression. Moreover, as later noted, the 4 1/6-cent and 5-cent passenger traffic showed small percentage losses while the commutation traffic jumped more than 16 per cent. The improvement in business conditions which began to be felt in the late summer, and the practical elimination of jitney competition which quickly followed the announcement of the Public Utilities Commission that it purposed to regulate such carriers, brought a change for the better. The last four months of 1915 registered material gains in passenger receipts over the same period of 1914.

In regard to the increase in operating expenses, it should be noted that this group included the addition of \$15,098 to the depreciation reserve over the usual allotment of 2.5 per cent of operating revenues charged to expenses, and a further sum of \$11,250 this year charged for the first time through expenses in monthly installments to the merit system reserve, to be used in payment of awards in July, 1916. These charges were heretofore met by the appropriation of a lump sum when due and payable. In explanation of the extra depreciation charge, it may be said that after the usual

allotment to depreciation, insurance and other reserves, and after the payment of a 5 per cent dividend, it was found that \$58,672 remained. Instead of carrying this amount to surplus, the directors decided to increase the allotment to the depreciation reserve, thereby reducing the amount of surplus for the year to \$43,574.

During 1915 the company carried 68,184,656 passengers, as compared to 69,679,440 in 1914. The decrease was brought about by a decrease of 1,222,284 or 2.8 per cent in 4 1/6-cent passengers, a decrease of 134,015 or 1.3 per cent in 5-cent passengers and an increase of 132,964 or 16.7 per cent in commutation passengers. The car-mile totals in 1915 and 1914 were 7,812,728 and 8,180,797 respectively. Other operating statistics, in cents, are shown in the following table:

	Per Car-Mile		Per Passenger	
	1915	1914	1915	1914
Passenger revenue	28.05	27.41	3.21	3.22
Other revenue	0.27	0.38	0.03	0.04
Gross revenue	28.32	27.79	3.24	3.26
Operating expenses	14.75	14.06	1.69	1.65
Taxes	1.74	1.74	0.20	0.20
Interest	3.60	3.47	0.41	0.41
Net income	8.23	8.52	0.94	1.00

The capital expenditures for 1915 totaled \$7,688, divided into \$3,937 for track and line, \$1,815 for car equipment and \$1,935 for miscellaneous items. The receipts from the sale of car equipment and old cable amounted to \$2,766, so that the net capital expenditures were \$4,921.

HOW OHIO LINES FARED

The Ohio Public Utilities Commission reports that for the year ended June 30, 1915, the street railways of the State made a better showing than the interurban lines. The aggregate revenue of the street railways was \$19,701,000, an increase of \$169,000. The operating expenses totaled \$13,204,000, a decrease of \$46,000, while the net revenue was \$6,496,000, an increase of \$215,000. The number of paid passengers was 547,495,000, an increase of 45,797,000 over the previous year.

For the interurban lines, however, the passenger and freight revenues, the operating expenses, the number of passengers carried and the freight tonnage all showed decreases for the last fiscal year. The operating revenue aggregated \$17,936,000, a decrease of \$643,000; operating expenses, \$11,442,000, a decrease of \$140,000; net revenue, \$6,493,000, decrease of \$502,000, and passenger revenue, \$15,320,000, a decrease of \$547,000. The number of passengers was 181,563,000, a decrease of 11,709,000.

There was an increase of 64 miles in interurban single track during the year, bringing the total up to 2809 miles. An increase of 60 miles was shown in street railway track, making the total 625 miles.

SUPPLEMENTAL ORDER ISSUED

In a supplemental order the Railroad Commission of California has authorized the Oakland, Antioch & Eastern Railway to issue certain notes and bonds in pursuance of a plan to refinance the company. According to the plan, the company was to issue \$1,095,000 of first mortgage bonds and \$262,200 of promissory notes. The bonds were to be sold to bondholders or to stockholders for cash, or issued instead of bond interest earned, and used by the company for capital purposes at not less than 80. The proceeds of both bonds and notes were to be used solely for the company's debts or for capital expenditures, represented by notes or accounts payable. The \$262,200 6 per cent notes were to be issued to the stockholders for cash at face value. Of the bonds, \$328,000 were to be pledged as security for the \$262,200 of notes, the stockholders being obligated in case of non-payment of principal or interest on notes to accept the pledged bonds in compensation at 80 per cent of face value. The original order provided that before any of the bonds or notes authorized were issued the company should furnish the commission with a list of its notes and accounts payable representing capital expenditures and a detailed statement explaining such expenditures.

In the supplemental order the commission finds that the reports are duly on file, and that it now appears that the company has collected the sum of \$90,911 from its stockholders as a part of the loan of \$262,200 and thus released from pledge \$46,000 face value of its bonds. The company will need \$68,000 additional bonds to be pledged as collateral security to carry into effect the previous order, the two amounts making \$114,000 of bonds which the company proposes to pledge as collateral for the \$90,911 of notes for the sums advanced. The \$114,000 represents the ratio of 80 per cent face value specified, and the company is authorized to pledge this amount of bonds as security for its note indebtedness.

The road connects San Francisco, Sacramento, Oakland and Antioch with a system with more than 120 miles of line.

THREE MONTHS' COMPARISON OF NINETY-SEVEN ROADS

The information bureau of the American Electric Railway Association has continued the comparison of earnings commenced by the Bureau of Fare Research and has just made public the figures for July, August and September. The roads are scattered throughout the United States, and the groupings followed are: Eastern District, east of the Mississippi River and north of the Ohio and Potomac Rivers; Southern District, east of the Mississippi River and south of the Ohio and Potomac Rivers; Western District, west of the Mississippi River. These groups contain forty-four, fourteen and thirty-nine companies respectively.

STATISTICAL RETURNS FROM NINETY-SEVEN ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

District	No. of Companies	A.—OPERATING REVENUE											
		Totals for Three Months 1915			July		1915 in per Cent of 1914	August		1915 in per Cent of 1914	September		1915 in per Cent of 1914
		1915 Dollars	1914 Dollars	per Cent of 1914	1915 Dollars	1914 Dollars		1915 Dollars	1914 Dollars		1915 Dollars	1914 Dollars	
United States....	97	51,569,621	52,872,014	97.54	17,423,863	18,067,895	96.44	17,138,215	17,704,904	96.80	17,007,543	17,099,215	99.46
East.....	44	36,712,991	37,268,880	98.51	12,395,176	12,702,173	97.58	12,182,145	12,498,075	97.47	12,135,670	12,068,632	100.56
South.....	14	1,854,645	1,996,446	92.90	618,860	677,119	91.40	608,116	664,015	91.58	627,669	653,312	95.78
West.....	39	13,001,985	13,606,688	95.56	4,409,827	4,688,603	94.05	4,347,954	4,542,814	95.71	4,244,204	4,375,271	97.00
United States....	97	29,856,149	30,035,794	99.40	10,103,122	10,345,756	97.65	9,939,999	10,068,469	98.72	9,813,028	9,621,569	101.99
East.....	44	20,563,295	20,650,272	99.58	6,984,229	7,089,761	98.51	6,820,438	6,958,601	98.01	6,758,628	6,601,910	102.37
South.....	14	1,009,987	1,177,647	85.76	341,178	408,440	83.53	338,124	391,379	86.39	330,685	377,828	87.52
West.....	39	8,282,867	8,207,875	100.91	2,777,715	2,847,555	97.53	2,781,437	2,718,489	102.32	2,723,715	2,641,831	103.10
United States....	97	21,713,472	22,836,220	95.08	7,320,741	7,722,139	94.80	7,198,216	7,636,435	94.26	7,194,515	7,477,646	96.21
East.....	44	16,149,696	16,618,608	97.18	5,410,947	5,612,412	96.41	5,361,707	5,539,472	96.79	5,377,042	5,466,722	98.36
South.....	14	844,658	818,799	103.16	277,682	268,679	103.35	269,992	272,636	99.03	296,984	277,484	107.03
West.....	39	4,719,118	5,398,813	87.41	1,632,112	1,841,048	88.65	1,566,517	1,824,325	85.87	1,520,489	1,733,440	87.72
United States....	97	3,493,430	3,382,621	103.28	1,135,074	1,146,503	99.00	1,220,716	1,122,389	108.76	1,137,729	1,113,729	102.15
East.....	44	2,497,848	2,376,919	105.09	800,569	809,665	98.88	890,950	786,549	113.27	806,329	780,705	103.28
South.....	14	136,748	131,209	104.22	46,767	43,244	108.15	43,762	43,879	99.73	46,219	44,086	104.84
West.....	39	858,834	874,493	98.21	287,738	293,594	98.01	286,004	291,961	97.96	285,092	288,938	98.67
United States....	97	57.89	56.81	....	57.98	57.26	....	58.00	56.87	....	57.70	56.27	....
East.....	44	56.01	55.41	....	56.35	55.82	....	55.99	55.68	....	55.69	54.70	....
South.....	14	54.46	58.99	....	55.13	60.32	....	55.60	58.94	....	52.68	57.66	....
West.....	39	63.70	60.32	....	62.99	60.73	....	63.97	59.84	....	64.17	60.38	....
United States....	97	57.89	56.81	....	57.98	57.26	....	58.00	56.87	....	57.70	56.27	....
East.....	44	56.01	55.41	....	56.35	55.82	....	55.99	55.68	....	55.69	54.70	....
South.....	14	54.46	58.99	....	55.13	60.32	....	55.60	58.94	....	52.68	57.66	....
West.....	39	63.70	60.32	....	62.99	60.73	....	63.97	59.84	....	64.17	60.38	....

Buffalo & Wellsville Railroad Corporation, Buffalo, N. Y.—The New York Public Service Commission for the Second District approved the transfer of the property and rights of the old Buffalo & Susquehanna Railway to the new Buffalo & Wellsville Railroad Corporation, which bought the property from the receiver. The commission has also authorized the new corporation to exercise the franchises and to operate under the certificate of public convenience and necessity approved and granted to the old company by the Railroad Commission. The order of the commission made public on Feb. 17 recites that the new corporation is capitalized for \$850,000 and that it as yet has no bonded indebtedness, though an application is pending before the commission for approval of an issue of bonds; that the property is subject to a mortgage of \$440,000, which was part of the purchase price paid by the Susquehanna Finance Corporation to the old company and that the new company has made a mortgage of \$360,000 as part of the purchase price which it paid to the Finance Corporation.

Cape Electric Tramways, Ltd., Cape Town, S. A.—The profit and loss account of the Cape Electric Tramways, Ltd., for the year ended June 30, 1915, showed a profit of £80,615. After providing for debenture interest, redemption of debentures, and after taking into account the balance brought forward from the preceding year, the company had remaining a net credit balance of £44,286. From this amount the reserve fund was credited with £12,000 and dividends of £24,561 were paid, leaving a balance of £7,724 to be carried forward. During the year the tramways carried 21,680,070 passengers earning £206,122, as compared to 20,886,146 passengers earning £200,409 in the preceding year. While the traffic thus showed some expansion, the company states that the war added considerably to the working costs on account of the additional cost of labor, the allowances granted to employees in the service, and the increase in the cost of all supplies.

Detroit (Mich.) United Railway.—Announcement is made that the \$12,500,000 capital stock of Detroit United Railway has been listed on the Detroit Stock Exchange. The stock is also listed on the New York, Montreal and Cleveland exchanges.

Electrical Securities Corporation, New York, N. Y.—Kissel, Kinnicutt & Company, New York, are offering at 99 and interest, to yield more than 5 per cent, \$1,000,000 of collateral trust sinking-fund gold 5 per cent bonds of the Electrical Securities Corporation, dated Feb. 1, 1916, and due on Feb. 1, 1946. These bonds are redeemable as a whole or in part at 103 and interest at any interest date upon twenty-one days' notice. The corporation is an investment company owning, among other public utility securities, the mortgage bonds of forty different electric railway, light and power companies. On Dec. 31, 1915, the assets, consisting exclusively of cash or securities at a conservatively appraised valuation, amounted to \$8,642,892, or more than twice the obligations on that date. The relative position will remain practically unchanged after the issuance of this series.

Gary, Hobart & Eastern Traction Company, Hobart, Ind.—Application has been made by S. A. Smith to the Superior Court at Hammond for the appointment of a receiver for the Gary, Hobart & Eastern Traction Company.

Interborough Rapid Transit Company, New York, N. Y.—The syndicate of bond distributing houses which agreed in December to take \$25,000,000 of the first and refunding 5 per cent bonds of the Interborough Rapid Transit Company, has been closed, and a new lot of \$5,000,000 of the same issue has been taken from J. P. Morgan & Company, managers of the underwriting syndicate that agreed to provide \$160,000,000 for subway construction in five years. When the smaller block has been disposed of it will bring the total placed by the distributing syndicate up to \$80,000,000. The Manhattan Railway has sold \$4,523,000 second mortgage 4 per cent gold bonds due 2013 to the Equitable Trust Company and E. H. Rollins & Sons, the two institutions acting jointly. The company asked for bids and twenty houses competed. It is understood that the high bid was an all-or-none bid for 87.15. The proceeds of the issue will be used for reimbursing the Interborough Rapid Transit Company, lessee, for third-track extension work on the elevated system. The

new bonds are being offered at 89 and interest to net 4.5 per cent.

Kansas City, Mexico & Orient Railway, Kansas City, Mo.—The Kansas Public Utility Commission has declined to approve the application made in the interest of the Kansas City, Mexico & Orient Railway to issue \$51,941,650 in stocks and bonds of a new company, in reorganization proceedings. It was proposed to issue \$15,003,600 of first mortgage bonds, \$27,573,383 of preferred stock and \$9,364,667 of common stock. The time for the deposit of the fifty-year first mortgage 4 per cent bonds of the Kansas City, Mexico & Orient Railway of 1901 and the Kansas City, Outer Belt & Electric Railway first mortgage 4 per cent bonds of 1903 expired on Jan. 31.

Kansas City (Mo.) Railways.—A representative of the Kansas City Railways and the city counselor of Kansas City appeared before the Missouri State Public Service Commission at Jefferson City recently in reference to the issuance of securities by the Kansas City Railways, the successor company to the Metropolitan Street Railway. Under the first mortgage the company asks authority to issue a total not exceeding \$22,364,200 of bonds. Under the second mortgage authority is asked to issue \$3,560,700 Series A and \$1,000,000 Series B bonds with another lot of \$730,000, described in another agreement, making a total of \$6,290,700 bonds under the second mortgage. Under the terms of the note agreement authority was asked to issue in principal amount not exceeding \$7,922,000 three-year 5.5 per cent secured gold notes.

Lancaster & Southern Street Railway, Millersville, Pa.—Application has been made for a receiver for the Lancaster & Southern Street Railway.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—Application has been filed with California Railroad Commission by the Los Angeles & San Diego Beach Railway for authority to issue notes for \$11,000 to the Southern Trust & Savings Bank, San Diego, a note for \$21,000 to the Merchants National Bank, San Diego, and notes for \$19,000 to the City National Bank, Los Angeles. These notes are to renew previous notes and are at 7 per cent interest. The company has \$2,000,000 of stock authorized, of which \$546,000 is outstanding fully paid up, \$165,000 outstanding on which 10 per cent has been paid, and a mortgage upon the property securing bonds in the sum of \$375,000. No dividends have been paid for five years.

New York (N. Y.) Railways.—Judge Lacombe on Feb. 15 signed the three final orders winding up the litigation connected with the dissolution of the old Metropolitan Street Railway and the New York City Railway, begun in September, 1907. The receivers were ordered to transfer to the New York Railways, on account of the claims held by it, all the property and assets of the two old companies under their control, except a sum sufficient to meet the claims of the general creditors allowed by the court, which must be handed over to the Guaranty Trust Company. The dividend allowed to all general creditors of the New York City Railway will be 42¼ per cent, and to all other creditors of the Metropolitan Street Railway 10 per cent. The judge also authorized the payment to the Third Avenue Railway by the Metropolitan of \$4,442,745 for rent, interest on bonds, rolling stock, and so on, and the third order dealt with certain payments to be made by the New York City Railway to the Metropolitan.

Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont.—Negotiations for the purchase of the Michigan Central Railroad's single-track line from Fort Erie and Bridgeport, Ont., to Niagara-on-the-Lake have been entered into by the Niagara, St. Catharines & Toronto Railway. The latter company has a franchise for a road from Port Colborne to Fort Erie, Ont., and from Fort Erie to Niagara-on-the-Lake and from St. Catharines to Toronto, via Hamilton. Application has been made by the company to Parliament for an extension of time in which to build these lines. The Michigan Central's Niagara branch has been used almost exclusively for passenger service during the last few years and is said to be a losing venture. Recently Bridgeburg instead of Buffalo was made the eastern terminal for the line.

Pine Bluff (Ark.) Company.—Eastman, Dillon & Company, New York, are offering at 92 and accrued interest, to yield approximately 5.55 per cent, \$700,000 of first mortgage, 5 per cent gold bonds of the Pine Bluff Company, dated March 22, 1912, and due on Jan. 1, 1942. The authorized amount of this issue is \$2,000,000, of which \$880,000 is outstanding. The company owns and operates the electric light and power, street railways and water supply properties in Pine Bluff, the street railway system comprising 9.5 miles of single track.

Schenectady (N. Y.) Railway.—The Schenectady Railway has applied to the New York Public Service Commission of the Second District for its approval of a new mortgage and bond issue of \$2,256,000 with which it is to release 800 shares of the stock of the Schenectady Illuminating Company from the lien of the present first mortgage of the Schenectady Railway. To do this the company must pay the bonds under this older mortgage to the amount of \$2,000,000 and as noted in the ELECTRIC RAILWAY JOURNAL of Feb. 12, page 333, it has called these bonds for March 1, 1916, at 110. Harris Forbes & Company have agreed to take the proposed new issue at 97½. Bonds to be called will be paid with the proceeds. When, in 1905, the Schenectady Railway was sold to the Delaware & Hudson Company and the New York Central Railroad by the General Electric Company it owned all of the stock of the Illuminating Company, 800 shares, and all of the stock of the Mohawk Gas Company, 4400 shares. Under the sale these two stocks were retained by the General Electric Company. The Illuminating Company stock was subject to the first mortgage and a consolidated mortgage of the railway. The gas stock was subject to the consolidated mortgage alone. The General Electric Company assumed the consolidated mortgage and has satisfied it. The railway had agreed that when this was done it would release the Illuminating stock from the lien of the first mortgage, and in making the present petition it states that the only way this can be done is by paying the bonds, which it proposes to do by this new mortgage and bond issue.

Seattle, Renton & Southern Railway, Seattle, Wash.—The property of the Seattle, Renton & Southern Railway, now in the hands of Scott Calhoun and Joseph Parkin, receivers, have been ordered sold at public auction on May 1 by the King County Superior Court Judge A. W. Frater. The claims against the company are \$1,240,000, and Judge Frater has fixed a minimum price of \$1,200,000. It is estimated that this will cover the claims against the receivership and the preferred claims of the bondholders. The receivership case has been in the courts for nearly four years.

Texas Traction Company, Dallas, Tex.—The directors of the Texas Traction Company and the Southern Traction Company are planning to consolidate the two lines under the name of the Texas Traction Company. A committee has been appointed by both companies to work out details. These properties, generally known as the Strickland lines, have been operated under one management but as separate corporations.

United Railways & Electric Company, Baltimore, Md.—The Maryland Public Service Commission has approved the application of the United Railways & Electric Company to issue \$2,750,000 of five-year 5 per cent notes for refunding and to provide funds for other financing noted in the ELECTRIC RAILWAY JOURNAL of Feb. 12, page 333. The commission has fixed upon 97.5 and interest as the price at which the notes are to be sold.

Winnipeg (Man.) Electric Railway.—The annual meeting of the Winnipeg Electric Railway, which was to have been held on Feb. 9, was postponed for two weeks. Jitney competition and the depression in the building trade following the war greatly affected in 1915 the earnings of the company. On Dec. 15, 1915, the dividend rate of the company was reduced to 8 per cent per annum. The earnings in the first eleven months of 1915 fell off 30 per cent as compared with 1914, due to some extent to jitney competition. In some months of the year the decrease was almost 50 per cent from the same month for 1914. The total earnings for the first eleven months of 1914, were \$1,547,412, as against \$1,086,528 for the first eleven months of 1915. In November, 1915, however, there was an actual increase in gross receipts of \$10,000 over the same month of 1914.

DIVIDENDS DECLARED

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

Northern Texas Electric Company, Fort Worth, Tex., 3 per cent, preferred; quarterly, 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, KENNEBUNK, ME.						
Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '16		\$23,288	\$19,306	\$3,982	\$610	\$3,372
1 " " '15		21,900	20,360	1,540	637	903
BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.						
1m., Dec., '15		\$73,106	*\$78,318	†\$5,212	\$22,358	††\$27,359
1 " " '14		76,639	*67,046	†9,593	17,385	††7,696
6 " " '15		498,746	*400,203	†98,543	106,885	††7,299
6 " " '14		524,025	*466,938	†57,087	103,306	††45,303
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Dec., '15		\$8,145	*\$8,319	†\$174	\$1,112	†\$1,286
1 " " '14		8,071	*8,091	†20	1,145	†1,165
12 " " '15		115,207	*\$96,433	18,774	13,492	5,282
12 " " '14		121,756	*101,749	20,007	13,141	6,866
CONNECTICUT COMPANY, NEW HAVEN, CONN.						
1m., Dec., '15		\$704,552	*\$477,524	\$227,028	\$99,722	†\$150,413
1 " " '14		630,642	*446,565	184,077	97,462	†108,479
6 " " '15		4,452,423	*2,974,355	1,478,068	592,736	†1,024,591
6 " " '14		4,192,386	*3,097,200	1,095,186	589,707	†635,637
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Dec., '15		\$69,454	*\$35,374	\$34,080	\$9,171	\$24,909
1 " " '14		55,655	*31,444	24,211	8,773	15,438
12 " " '15		723,091	*386,447	336,644	105,562	231,082
12 " " '14		673,095	*401,932	271,163	101,638	169,525
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Dec., '15		\$101,469	*\$46,507	\$54,962	\$4,181	\$50,781
1 " " '14		88,336	*42,956	45,430	4,191	41,239
12 " " '15		981,888	*521,059	460,829	50,368	410,461
12 " " '14		1,041,792	*575,471	466,321	51,356	414,965
KEOKUK (IOWA) ELECTRIC COMPANY						
1m., Dec., '15		\$21,069	*\$12,481	\$8,588	\$1,859	\$6,729
1 " " '14		20,432	*13,752	6,680	1,884	4,796
12 " " '15		232,593	*151,156	81,437	22,400	59,037
12 " " '14		249,062	*160,269	88,793	24,286	64,507
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.						
1m., Dec., '15		\$23,650	*\$24,168	†\$518	\$7,995	††\$8,473
1 " " '14		24,466	*23,590	876	7,876	††6,981
6 " " '15		210,310	*159,499	50,811	47,998	†3,166
6 " " '14		214,808	*161,924	52,884	47,254	†5,902
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.						
1m., Dec., '15		\$42,795	*\$46,228	†\$3,433	\$85,541	††\$7,641
1 " " '14		38,043	*45,618	†7,575	\$6,364	††12,406
6 " " '15		257,135	*254,386	2,749	\$36,001	††23,682
6 " " '14		225,116	*261,352	†36,236	\$36,886	††63,600
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Dec., '15		\$156,941	*\$93,912	\$63,029	\$29,250	\$33,779
1 " " '14		162,561	*87,543	75,018	28,698	46,320
12 " " '15		1,713,213	*1,049,709	663,504	330,817	332,687
12 " " '14		2,071,098	*1,151,237	919,861	317,503	602,358
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.						
1m., Dec., '15		\$379,817	\$217,965	\$161,852	\$53,040	\$108,812
1 " " '14		316,331	197,415	118,966	50,533	68,433
12 " " '15		3,890,751	2,373,010	1,517,741	628,309	889,432
12 " " '14		3,636,085	2,237,429	1,398,656	606,898	791,758
RHODE ISLAND COMPANY, PROVIDENCE, R. I.						
1m., Dec., '15		\$440,663	*\$350,340	\$90,323	\$120,150	††\$28,149
1 " " '14		411,510	*314,186	97,324	117,308	††18,337
6 " " '15		2,756,262	*2,047,156	709,106	722,286	†21,776
6 " " '14		2,788,017	*2,038,481	749,536	709,108	†78,440
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Dec., '15		\$68,903	*\$44,271	\$24,632	\$23,330	\$1,302
1 " " '14		71,678	*45,578	26,100	23,421	2,679
12 " " '15		794,213	*518,488	275,725	278,492	†2,767
12 " " '14		842,639	*552,987	289,652	275,333	14,319
TAMPA (FLA.) ELECTRIC COMPANY						
1m., Dec., '15		\$85,770	*\$44,326	\$41,444	\$4,344	\$37,100
1 " " '14		85,501	*42,327	43,174	4,423	38,751
12 " " '15		981,049	*502,901	478,143	52,344	425,804
12 " " '14		981,000	*520,078	460,922	54,488	406,434

*Indicates 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

UNION TRACTION OF INDIANA ADVERTISES BRADY MEDAL AND SERVICE

In connection with a campaign of education which the Union Traction Company of Indiana, Anderson, Ind., is conducting to stimulate traffic in the cities touched by its lines, the fact that it has been awarded the Anthony N. Brady Memorial Association Medal for safe and efficient operation has received considerable prominence. After listing the principal points touched by its various lines and connections, the advantages these lines offer for the transportation of passengers and freight are set forth in an article which reads in part as follows:

"This interurban railway was a pioneer electric line in both passenger and freight transportation, and it is first and foremost in all things pertaining to these classes of service. It has been stated that the electric railways since their installation were responsible for 40 per cent of the growth of Indianapolis, and it is safe to say that every city, town and hamlet touched by the tracks of the Union Traction Company has been benefited in the same degree. The operation of electric railways is so closely allied to the business interests of the territory they serve that there exists a community feeling not found between these interests and the steam roads.

"When we look back over a period of fifteen years, it is difficult to realize that a trip from Fort Wayne to Indianapolis meant a loss of two days, particularly when at present there is through electric service in each direction every two hours. The business man living 50 miles or even 100 miles away from the capital is comparatively as close to it at present, as the man who lived at Zionsville fifteen years ago. This is true not only of the individual as a passenger, but of his merchandise as well.

"An investigation made some time ago demonstrated that only a small proportion of the vegetables and small fruits used in Indianapolis was raised in close proximity to that city. Most of these commodities are shipped from distances varying from 75 miles to 150 miles. This requires refrigeration, at an additional expense to the consumer. There seems to be no reason why intensified farming could not be carried on as profitably 10 miles from a big market like Indianapolis as it is at a distance of 100 miles. Certainly there are advantages to be gained in the lower freight rates and the opportunity for direct barter between the producer and the consumer such as could be arranged through a central market served by the interurban lines. Such a plan is worthy of the serious consideration of commercial bodies. This, however, is only one of the many prospects for the betterment of any city made possible by the interurban railway systems, with which Indiana is as well served as any other State in the Union."

WATERLOO TRIES TO STOP ONE-MAN CAR OPERATION

Early in December, 1915, the Waterloo, Cedar Falls & Northern Railway placed one-man cars in service on all but one of its lines and, at the same time, maintained the existing schedules. The old single-truck, double-end cars were remodeled for one-man operation by inclosing the platforms, providing door-operating mechanisms and fare boxes. On Jan. 26, after the one-man cars had proved more than sufficient to meet the service requirements, an ordinance requiring two-men crews on all local cars was passed, but acting upon the request of the railway company the City Council delayed putting it into effect until Feb. 1. In the meantime the company obtained a temporary injunction to restrain the newspapers from publishing the ordinance and thus prevented it from becoming law. Sentiment against one-man car operation was largely centered around the Mayor and the City Council, as several of the local newspapers and commercial and civic organizations of Waterloo had expressed themselves as satisfied with the service the one-man cars were furnishing. The petition requesting the tempo-

rary restraining order refutes the various objections to one-man cars, and states that a marked decrease in the gross receipts during 1915 made their adoption absolutely necessary in the interest of economy. The company hopes to have the temporary injunction made permanent.

One-Man Cars Authorized in Corpus Christi.—The Council of Corpus Christi, Tex., has passed an ordinance permitting the operation of one-man cars in the city.

Oakland Jitney Ordinance Enforced.—The city of Oakland, Cal., has put an end to the jitneys of the Oakland Pleasure Club, which sought to evade the provisions of the amended jitney ordinance in that city prohibiting the operation of jitneys in downtown Oakland. On Feb. 16 sixteen drivers were arrested to constitute test cases. The following day no jitneys appeared in the forbidden district.

Copper Zone Fare System to Be Extended.—It is stated that the Shore Line Electric Railway, Norwich, Conn., proposes to apply to its division between New London and Willimantic and on the branch from Willimantic to Coventry the copper zone system of fares in use by the company between New London and New Haven since last fall. This system was described and illustrated in the *ELECTRIC RAILWAY JOURNAL* of Sept. 11, 1915, page 444.

Joint Operation Arranged in California.—An agreement providing for the joint operation of their lines has been announced by the Central California Traction Company, San Francisco, Cal., and the Tidewater Southern Railroad. President Byron Bearce of the Tidewater Southern Railroad is quoted as follows: "We have merely effected a sort of consolidation in order to operate the roads jointly, our purpose being to cut down expenses and increase efficiency."

Application for Fare Reduction Refused.—The Public Service Commission for the Second District of New York has refused to order the Warren & Jamestown Street Railway, Warren, Pa., to reduce its fare between Jamestown and Frewsburg from 10 cents to 5 cents. The commission held that because of the expensive construction of the line between the two towns, the comparatively limited number of passengers carried and the transfer privileges accorded, the rate was fair and reasonable for the ride of 6 miles.

Disorderly Night Hawks Arrested.—At the request of officials of the International Railway, Buffalo, N. Y., the police have detailed plain clothes specials to ride the "owl" cars on the city lines and arrest all passengers creating a disturbance. On the first night after the order had been issued seven roughs were arrested and when arraigned in court were fined \$10 each. Others have been fined \$25 and \$50. Disorder has occurred almost entirely on the lines in the East side, which is populated largely by foreigners.

Decision in Rhode Island Against One-Man Cars.—The Public Utilities Commission of Rhode Island has dismissed the petition of the Newport & Providence Railway appealing from an ordinance of the Town Council of Middletown, which ordered that all street cars operated through the town must have a crew of two men. The company inaugurated the one-man system of operation between Washington Square, Newport, and the naval training station. Later the system was introduced on its main line from Newport to Bristol Ferry.

Petition Presented for Jitney Election.—A petition, signed by the required numbers of voters, has been presented the City Commission of Dallas, Tex., by the jitney drivers asking for an election on a new ordinance, in which the principal changes from the present ordinance are as follows: drivers' license is raised from \$10 to \$20 a year; license for the cars is reduced from \$65 to \$20 a year; number of passengers unlimited; no restrictions as to passengers riding on running board or other parts of cars; clause stating jitneys are common carriers omitted.

Ohmer Prize Offer Renewed.—John F. Ohmer, president of the Ohmer Fare Register Company, Dayton, Ohio, believing that the employees of the Denver (Col.) Tramway are capable of attaining still a higher degree of efficiency in Ohmer register operation for 1916 than they did during the past year, has renewed his prize offer of \$200 for the year 1916, to be distributed in three premiums as heretofore, Conditional that the general average for 1916

will exceed the general average of 98.08, which was made for 1915. He has also included in this offer his special prize of \$25, to be awarded to the two conductors who make the best individual records for 1916.

Cars Making 'Em Old Maids.—The *United Railroads Magazine*, published by the United Railroads, San Francisco, Cal., published in its issue of February, 1916, the following item: "Does poor car service affect the matrimonial chances of young women living in the district poorly served? There is one man living out in the Potrero who believes it does. He is Michael Dunnigan, who is very sore at the United Railroads for discontinuing the '30' car which used to run from Eighth and Market. 'The girls out here are all becoming old maids,' he says. 'A young man comes out to see them—once. But he never comes again, the car service is that bad.' The only calamity that the company has not been charged with as yet is the European war. However, the war is not over."

Prohibition Affects "Owl" Service.—The effect of the dry law which went into operation on Jan. 1 has been felt by the traction companies in both Oregon and Washington, and the larger companies, among them the Portland Railway, Light & Power Company, the Puget Sound Traction, Light & Power Company, the Tacoma Railway & Power Company and the Washington Water Power Company, have or will put in operation new schedules reducing the "owl" service, which has been operated after midnight for the convenience of patrons. The average reduction in "owl" car patronage in Portland since Jan. 1 is reported as 25 per cent, based on a check of southbound "owl" traffic on four important lines. The Puget Sound Traction, Light & Power Company, Seattle, revised its "owl" schedules effective on Jan. 24.

Portland Jitneys Fair Weather Birds.—City Attorney La Roche, Portland, Ore., asserts that the jitney buses licensed to operate in Portland violated the provisions of the city ordinance during the recent storm by failing to attempt to operate and also by arbitrarily increasing their rates of fare. Mayor Albee, upon being notified, instructed police officers to arrest drivers who were operating without complying with the ordinance, which requires jitneys to operate during the morning and evening rush hours and to maintain 5-cent fares, unless a higher rate is posted on the windshield. During the storm many jitneys abandoned their regular service and operated as taxicabs. Others attempted to give no service of their own, but waited until the street railways cleared their tracks and then operated only in the cleared districts.

Electric Railway Officials Support Anti-Smoking Bill.—Clark V. Wood, president of the Springfield (Mass.) Street Railway, and David A. Belden, president of the Massachusetts Northeastern Street Railway, appeared before the legislative committee on street railways at Boston on Feb. 17 on behalf of the Stacy bill prohibiting the carriage of lighted pipes, cigars or cigarettes on closed passenger cars of street railways. The bill specifies that it shall be the duty of the conductor to call the act to the attention of observed violators, and provides a fine of \$10 maximum for refusal to obey the statute. Special cars or compartments provided for smoking are exempted. Mr. Wood said that the presence of the bill on the statute books would be a strong deterrent against an evil which cannot be dealt with effectively at present. R. H. Holt, for the Boston Elevated Railway, also favored the bill.

Conference on Service in Toledo.—At a conference between a special committee of the City Council of Toledo, Ohio, and F. R. Coates, president of the Toledo Railways & Light Company, on Feb. 7, Mr. Coates told the city officials that the only way to prevent congestion and crowded cars was for the city to grant a new franchise or order the company not to accept 3-cent fares during the rush hours morning and evening. He assured them that the company could not secure money on a day-to-day franchise to purchase additional cars and that if an order were placed now for cars, deliveries could not be made until Jan. 1, 1917. The company desired to make improvements and grant an advance in wages to the men, but new construction could not be financed on a satisfactory basis with the franchise unsettled, and the receipts under the present fare did not justify an advance to the men.

Personal Mention

Mr. C. S. Reed, auditor of the Durham (N. C.) Traction Company, has been elected secretary of the company to succeed Mr. J. Martin Umstead.

Mr. G. A. Richardson, heretofore superintendent of railway of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has had his title changed to general superintendent of the railway department.

Mr. B. F. Boynton, claim agent of the Portland Railway, Light & Power Company, Portland, Ore., has been elected president of the Pacific Claim Agents' Index Bureau, which hereafter will be located permanently in Portland.

Mr. E. C. Johnston, formerly assistant purchasing agent of the Columbus Railway, Power & Light Company, Columbus, Ohio, has been appointed purchasing agent of the East St. Louis & Suburban Railway, East St. Louis, Ill., and will have charge of all storerooms.

Mr. Wilford Phillips, manager of the Winnipeg (Man.) Electric Railway, has been granted six months' leave of absence owing to ill health. He is at present in Los Angeles, Cal. Mr. Harry Hartwell is acting manager, as noted previously in the *ELECTRIC RAILWAY JOURNAL*.

Mr. John S. Bates has been appointed chief engineer of the Fresno (Cal.) Interurban Railway. This company is now having a 7-mile extension constructed between Barton Vineyard and Kutner Colony, and is planning the construction of other extensions this summer of about 15 miles.

Mr. E. B. Atchley, formerly connected editorially with various Western newspapers, and recently special editorial writer on the *Kansas City Post*, has been made head of the new publicity department of the Kansas City (Mo.) Railways, in charge of publicity, advertising, safety-first work and welfare.

Mr. D. B. Teagarden, who has resigned as chief dispatcher of the Los Angeles (Cal.) railway to accept a position with the Bloch Uniform Company, Cleveland, Ohio, was the guest of honor at a surprise banquet by more than 100 of his associates, at which he was presented a traveling case.

Mr. R. L. Lindsey, general manager of the Durham (N. C.) Traction Company, has in addition been elected vice-president of the company, in which capacity he succeeds the late H. A. Foushee. Mr. Lindsey has been connected with the Durham Traction Company for sixteen years.

Mr. James W. Samuel, chief clerk in the office of Mr. James Adkins, treasurer of the United Railways, St. Louis, Mo., has been promoted to assistant secretary and treasurer of the company. Mr. Samuel entered the employ of the company in 1895 and has been in the service continuously since that time.

Mr. Van Horn Ely has been elected president of the Chicago & Joliet Electric Railway, Joliet, Ill., to succeed Mr. J. J. Sullivan, Philadelphia. The Chicago & Joliet Electric Railway is controlled by the American Railways, which recently amalgamated with the National Properties Company, of which Mr. Ely is president.

Mr. J. R. Blackhall, general manager of the Chicago & Joliet Electric Railway, Joliet, Ill., and president of the Illinois Electric Railway Association, has been elected president of the Illinois Valley Way Association, which contemplates the construction of a hard road from Chicago to Peoria through Joliet, Morris, Ottawa and LaSalle.

Mr. George P. James has resigned as chief civil engineer of the Puget Sound Traction, Light & Power Company, Seattle division. Owing to the transfer of all railway construction work to the Stone & Webster Engineering Corporation and the necessary abandonment of practically all of the civil engineering work heretofore carried on by the company, the office of chief civil engineer has been abolished.

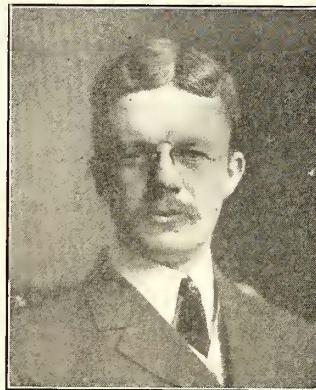
Mr. George S. Quinan has been appointed engineer of the Puget Sound Traction, Light & Power Company, Seattle division, in charge of the engineering department. Under

the head of this new department will be grouped all engineering except that done by the Stone & Webster Engineering Corporation, and such minor engineering as may be found impracticable to separate from the operation.

Mr. R. J. Higgins, city counselor of Kansas City, Kan., is to be chief counsel for the Kansas City (Mo.) Railways in Kansas City, Kan. **Mr. O. L. Miller** will continue as associate counsel on the Kansas side. **Mr. A. L. Berger**, who has been special attorney for the receivers in matters pertaining to the Kansas side, will continue in that capacity. **Mr. Higgins** has been city counselor on the Kansas side since the adoption of commission government six years ago. He is thirty-two years old and has practised law nine years.

Mr. S. P. Broome has resigned as assistant purchasing agent of the East St. Louis & Suburban Railway, East St. Louis, Ill. **Mr. Broome** has been with the company for eight years, first in charge of meters and arc lamps, then as assistant to the master mechanic, then general storekeeper, then assistant to one of the former general superintendents, and for the last four years in charge of all purchases as assistant purchasing agent under the general superintendent. **Mr. Broome** has become connected with the **A. M. Byers Company**, Pittsburgh, Pa., to introduce their products into use with the steam railroads.

Mr. Henry M. Brinckerhoff has been appointed chief engineer of the Chicago Traction & Subway Commission to have charge of the investigation of traffic conditions in Chicago to determine on a plan for consolidated operation of elevated, surface, and, possibly, subway systems for Chicago. **Mr. Brinckerhoff** was graduated in mechanical engineering from the Stevens Institute of Technology in the year 1890, and has been engaged for a great part of his professional career in electric traction work. He was engaged upon the original electrification of the horse car lines in Boston in 1890 and 1891, and in 1892 went to Chicago as assistant engineer for the intramural railway at the World's Fair.



H. M. BRINCKERHOFF

He was patentee of the third-rail system, devised and used for the first time on that railroad, and since generally applied on the elevated railroads of the country and on many interurban and steam railroad installations. During the World's Fair he was in charge of the electrical operation of the intramural railway and at the close of the fair was appointed electrical engineer of the Metropolitan West Side Elevated Railway, Chicago. As electrical engineer he designed and installed the electrical equipment for this company, and in succeeding years took charge of the equipment as superintendent of motive power, and later as assistant general manager, becoming in 1898 general manager of this company, in which capacity he remained until 1906. This was the first permanent commercial operating third-rail system. **Mr. Brinckerhoff** left railway work in Chicago to join the firm of **Barelay Parsons & Klapp**, of which he is a partner. During the past ten years, since leaving Chicago, he has been engaged upon a considerable variety of consulting engineer work with this firm, but has devoted a large part of his attention to traction problems. In this period he has investigated and reported upon many of the operating conditions of the largest companies in this country and has visited and studied the systems of Europe as well. The most recent piece of work on city traffic done under **Mr. Brinckerhoff's** immediate supervision and direction was the report to the Street Railway Commission of Detroit by his firm, which was retained to examine and report upon a plan for relieving the congested conditions of the street railways and to suggest a possible subway system. This report appeared in March, 1915, and was summarized in the *ELECTRIC RAILWAY JOURNAL* of April 3, 1915, page 664. **Mr. Brinckerhoff** has established headquarters in the Home Insurance Building, Chicago.

Mr. H. L. Brownell, whose work as safety expert of the Chicago (Ill.) Surface Lines has been mentioned frequently in these columns, has resigned from that position to become



H. L. BROWNELL

a public safety engineer, in which capacity he will give safety lectures and organize safety campaigns for electric railways. **Mr. Brownell** was born in Saratoga County, N. Y., in 1865. He began electric railway work as a gripman with the Denver (Col.) Tramway Company in 1888 and left that company in 1893 to become a conductor on the Chicago City Railway. Later he entered the law and claim department of the Chicago City Railway under **Mr. Mason B. Starring**, then general counsel. From 1900 until 1909 he was not in railway work, but at the end of that time he accepted a position with the law department of the Boston (Mass.) Elevated Railway. In 1910 **Mr. Brownell** took charge of the claim clerk system of the Chicago Railways. Two years later he was relieved of that position in order to organize and conduct the safety bureau for the railway company. While at the head of this bureau **Mr. Brownell** supervised the taking of a number of safety moving-picture films which he has since shown more than 800 times in connection with lectures in Chicago and thirty other cities in the country. In 1913 he assisted the coroner of Cook County to organize a public safety commission and took an important part in the work of the Citizens' Traffic & Safety Commission, a body appointed by the Chicago City Council. **Mr. Brownell** is also identified with the Safety First Federation of America and the National Safety Council.

OBITUARY

G. J. A. Paul, manager of railways of the Mahoning & Shenango Railway & Light Company, died at his home in Youngstown, Ohio, on Feb. 19. **Mr. Paul** had been ill since December with heart trouble.

Alexander McRae, formerly superintendent of the Lowell, Lawrence & Haverhill Street Railway and of late connected with the Massachusetts Northeastern Street Railway, Haverhill, Mass., is dead.

James B. Robinson, consulting engineer, who was connected with the Southern Pacific Company for many years and later with the Northern Pacific Company, died at Portland, Ore., on Feb. 12. **Mr. Robinson** built the Butte County Railroad between Chico, Cal., and Stirling City, and also the present street railway in Chico.

Thomas C. Penington, who was secretary and treasurer of the American Street Railway Association from 1895 to the time of its reorganization in 1905, died at his home in Chicago, Ill., on Feb. 19. **Mr. Penington** succeeded **William J. Richardson** as secretary of the association. Up to the time of the reorganization in 1905, the office of secretary and treasurer of the association was filled by a man who was also active in railway work, and while he held office with the association **Mr. Penington** was also secretary and treasurer of the Chicago City Railway, with which he was connected altogether for about twenty-five years. In 1906, with a change in management of the Chicago City Railway, **Mr. Penington** retired from that company and since that time has engaged in general business in Chicago. Although not actively engaged in railway work **Mr. Penington** attended several conventions since 1905, the last one being that in Chicago in 1912. **Mr. Penington** was as large in heart as he was in frame, and although the duties of secretary and treasurer of the association in those early days were not arduous he performed them ably and thoroughly, and it was largely through his personal popularity and the energy which he put into his work as secretary that the association made the progress which it did between 1895 and 1905.

Construction News

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

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

FRANCHISES

East San Diego, Cal.—Application has been made to the Council of East San Diego for a franchise to construct and operate an electric railway for a period ending Sept. 1, 1952. Bids will be received until March 6 for the proposed franchise.

Naugatuck, Conn.—The Connecticut Company has asked the Council for a franchise to double track its line on North Main Street, Naugatuck, from a point in the vicinity of Maple Street to Weber's Switch in Union City.

Newport, Ky.—Officials of the South Covington & Cincinnati Street Railway and the Union Light, Heat & Power Company met with the City Commissioners on Feb. 14 to discuss proposed new franchises. The company officials stated that they could pay no rent for the use of the streets, but that if franchises are granted both companies, a first-class street railway service will be given and a superior light system will be installed. The ownership of the companies is almost identical.

Buffalo, N. Y.—The Public Service Commission for the Second District of New York has approved the franchise granted by the city to the International Railway for tracks in Bailey Avenue, Buffalo, between Kensington Avenue and East Delevan Avenue and between East Ferry Street and Seneca Street. These tracks will complete the International's trackage in Bailey Avenue, and the order of the commission recites the need of the service to be supplied to the rapidly growing section near the city line and the transfer facilities which will be afforded with the various other lines of the company crossing Bailey Avenue. The new franchises from the city include lines provided for but never built, in franchises granted many years ago to the Buffalo Traction Company, which old franchises were taken over by the International Railway at the time of the consolidation.

Terrell, Tex.—The City Commission of Terrell has extended the limit of the franchise granted Stone & Webster for use of certain streets in Terrell until April 20, 1917, in which to begin construction of the Dallas-Terrell Interurban Railway.

TRACK AND ROADWAY

Pacific Electric Company, Los Angeles, Cal.—At a recent meeting of the Thomas Jefferson Club plans were discussed for a new short line transportation service between Pasadena and Los Angeles and will be presented to the Pacific Electric Company for its consideration. It is proposed to extend the North Loop track from its present terminus at East Orange Grove and Allen Avenues, Pasadena, to connect with the Sirra Madre line to Los Angeles.

Martinez & Concord Interurban Railway, Martinez, Cal.—The routing of this company's proposed line has been changed by the city trustees of Martinez so that cars will operate along Main Street instead of Estobar Street. The company made an application to the Board of Supervisors for a franchise to construct its line along the county road. The franchise was not granted, but will be further considered at a special meeting. [Feb. 12, '16.]

Lordship Park Association, Bridgeport, Conn.—Plans are now being made by this company for direct trolley service to Lordship Park from the center of the city. It is expected that the Public Utilities Commission of Connecticut will soon grant a petition to permit the operation of the Lordship Park Association's cars over the Connecticut Company's tracks from Hollister and Stratford Avenues down Stratford Avenue to Main and Fairfield Streets, thence around the loop of Main, Golden Hill and Water Streets and return to Lordship Park, where the tracks will be extended to the Casino. The present terminus of the Lordship Park Associ-

ation is at Hollister and Stratford Avenues. If permission is granted and suitable trackage terms are made with the Connecticut Company through service will probably begin June 1.

Miami (Fla.) Traction Company.—This company has received an amendment to its charter permitting it to build a street railway system covering approximately 350 miles and extending from West Palm Beach to Cape Sable, to Miami Beach and across the State to Tampa. Through this amendment the company is authorized to do business in the counties of Dade, Broward, Palm Beach, Lee, DeSoto, Polk, Manatee, Hillsboro and Monroe.

Covington & Oxford Street Railway, Covington, Ga.—Work has been begun by this company preparing its line for electric railway service, heavier rails being used. Horse-cars are being used at present on the line.

Kankakee & Urbana Traction Company, Urbana, Ill.—The bridge which this company purchased last fall from the Central States Bridge Company of Indianapolis has arrived and has been hauled to the site of its installation. With favorable weather, cars will be running from Urbana to Paxton within two months.

Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.—There is indication that this company's line, which at present operates only as far as Rushville will be extended 62 miles to Cincinnati, within a short time. The city of Cincinnati in April will vote on a proposed \$6,000,000 bond issue for the construction of a 15-mile terminal loop. The Cincinnati rapid transit commission has recommended a certain routeing. The Indianapolis & Cincinnati Traction Company is very desirous of extending its line and has acquired the Cincinnati & Westwood Railroad, a suburban line, which will be used as a connecting link.

Fort Scott, Kan.—L. A. Wells Construction Company, 34 Wade Building, Cleveland, Ohio, will receive figures on approximately 250,000 cu. yd. of grading for the construction of an electric railway from Fort Scott to Mulberry, work to be begun as soon as the weather will permit. The company is also in the market for steel rails and connections, ties, poles, trolleys and high-tension wires, special work, copper bonds, cars and electrical apparatus for power house and substation. The desire of this company to receive bids for this material was referred to on page 376 of the ELECTRIC RAILWAY JOURNAL for Feb. 19.

Wichita Railroad & Light Company, Wichita, Kan.—Plans are being made by this company to construct a bridge over the Arkansas River at Douglas Avenue to cost about \$50,000.

***Boston, Mass.**—A petition has been presented to the City Council for a new car line and wider traffic artery to extend from Franklin Park near Egleston Square to the Jamaicaaway. The matter was referred by the Council to the Board of Street Commissioners for a report on the need and practicability of the proposition, as well as an estimate of the probable cost.

Detroit (Mich.) United Railway.—This company plans to build 18 miles of extensions to the Detroit city lines, and will double track approximately 9 miles of its interurban lines at points on the different divisions of its system. This double tracking will consist largely of lengthening existing sidings so that they will form a part of an ultimate double tracking for an entire division.

Kansas City & Tiffany Springs Railway, Kansas City, Mo.—It is reported that a contract has been awarded to Willard E. Winner for the construction of this company's proposed line from Kansas City to Tiffany Springs, 15 miles. H. G. Pert, president. [Jan. 29, '16.]

Metropolitan Street Railway, Kansas City, Mo.—This company's tracks on Swope Parkway will be reconstructed from Forty-ninth Street to Swope Park. There will be a 26-ft. roadway on each side, with 40 ft. on the east and west sides for sidewalks and parking. The tracks will be paved with bituminous macadam.

United Railways, St. Louis, Mo.—A committee of five has been appointed by President Haller of the Board of Aldermen to confer with officials of the United Railways re-

garding a car line from the proposed North Market Street docks to Suburban Park. The route for the proposed line is from the North Market Street docks to Broadway, north to St. Louis Avenue, west to Belt Avenue, to Maffitt Avenue and out to Suburban Park.

Butte (Mont.) Electric Railway.—A report from this company states that material has been ordered for the construction of about 1 mile of track through Wilson Park Addition and the double-tracking of 2 miles on its Englewood line.

Albany Southern Railroad, Albany, N. Y.—It is reported that plans are being considered by this company to extend its road to the Massachusetts State line, there to connect with an extension that it is proposed to have the Berkshire Street Railway make. The Albany Southern Railroad is negotiating to procure an extension of its road to the Rutland Railroad and use a part of that road to carry out its plan of operating to Pittsfield. It is said that part of the Chatham division of the Rutland Railroad would be electrified between Brainard Station and Lebanon Springs.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has denied the application of the Newman & Carey Subway Construction Company, Inc., for permission to prosecute work on Section No. 1 of Route No. 29, the Nostrand Avenue subway in Brooklyn, by the open cut method on the east side of Nostrand Avenue between Malbone Street and Leferts Avenue. The contract allows open trench work in certain parts of Nostrand Avenue, but not in the section mentioned between Malbone Street and Leferts Avenue.

Interborough Rapid Transit Company, New York City.—Upon the report of Alfred Craven, chief engineer, the Public Service Commission for the First District of New York has declared a part of the Queensboro subway extension ready for operation, and has authorized the Interborough Rapid Transit Company to begin the early operation of the line. The portion declared ready for operation extends from the Jackson Avenue station to the Hunters Point Avenue station. The opening of this extension will have an important effect upon operation, as the Long Island Railroad has a station at Hunters Point Avenue adjoining the new subway station, and it will be possible for commuters using the Long Island Railroad to get off at Hunters Point Avenue and take the new subway into Manhattan. Operation of the Queensboro subway, formerly called the Steinway Tunnel, now extends from the station in Manhattan, located under Forty-second Street between Lexington and Third Avenues, under Forty-second Street, the East River and to Jackson and Van Alst Avenues, Long Island City. An extension of the line is under construction from that point through Davis Street and Ely Avenue to the Queensboro Bridge, where it will connect with the new rapid transit lines running to Astoria and to Corona.

Durham (N. C.) Traction Company.—At the annual meeting of the stockholders of this company it was decided to expend \$100,000 for improvements to its system during this year.

Northern Ohio Traction & Light Company, Akron, Ohio.—During the coming spring this company plans a complete renewal of its tracks in Market Avenue, Canton, from Sixth Street North to Sixth Street South.

Cleveland & Sharon Rapid Transit Company, Cleveland, Ohio.—This company has applied to the Public Utilities Commission of Ohio for permission to sell \$195,000 worth of bonds and \$75,000 worth of stock for constructing an electric railway between Middlefield and Lockwood, 12 miles. The cost is estimated at \$261,000. Extensions to the north and south are planned. C. A. Black, president, and C. H. Felton, secretary. [Aug. 7, '15.]

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—In addition to other improvements to be made during the spring, this company will go over its entire roadbed between Findlay and Toledo and place it in the best possible condition, removing all the old ties and replacing the worn rails.

Morrisburg & Ottawa Electric Railway, Ottawa, Ont.—It is reported that work will be begun next May on the construction of this company's line from Morrisburg to Ottawa. J. G. Kilt, Ottawa, president.

Toronto, Ont.—The hydro-radial by-laws have been passed by the ratepayers of Toronto and Etobicoke Townships. A hydro-radial by-law will be resubmitted to the electors of Blanchard Township on March 13. This by-law was defeated last January.

Toronto, Barrie & Orillia Electric Railway, Toronto, Ont.—The application of the Toronto, Barrie & Orillia Railway to be allowed to proceed with the construction of its proposed line was heard by the Cabinet Council of the Ontario government on Feb. 17. The company received authority some years ago to build the line and last year an application was made for a five-year extension of time which was granted on the condition that it would not come in force until a proclamation had been made by the Lieutenant-Governor. It was then agreed by the company that the gage and construction of the line be approved by the Hydro-Electric Power Commission and that the commission would have the right to acquire the line at any time at the actual cost thereof. On Feb. 17 the company, through its solicitors, asked that the act now be proclaimed by the Lieutenant-Governor, claiming to have already spent \$55,000 in preliminary work and in grading, and to be allowed to proceed with the construction of the road. [Dec. 11, '15.]

Southern Pacific Company, Portland, Ore.—It is reported that this company will begin work this spring on the construction of the Holgate Street steel viaduct. It is estimated that the cost will be about \$30,000.

***Lancaster, Pa.**—It is reported that surveys have been begun for an electric railway between Lancaster and Holtwood. Construction will begin this spring.

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—Two routes across eastern Ohio territory are being sought by engineers of this company. One route would cross the State line into Columbiana County and, after touching East Palestine and New Waterford, connect with the Youngstown & Southern Railway at Columbiana. The other would pass through the county further south and form a connection with the Youngstown & Ohio River Railroad at Lisbon. The main line of this road lies between Pittsburgh and Newcastle.

Reading (Pa.) Transit Company.—This company has signed a contract with the Counties Gas & Electric Company, Morristown, to supply the electric power for operating its cars, commencing May 1, 1916. At present power is transmitted from stations in Collegeville and Shawmont, Pa. These two plants will be discontinued.

Cleburne (Tex.) Traction Company.—Work has been begun by this company rehabilitating its line in Cleburne.

Corpus Christi Railway & Light Company, Corpus Christi, Tex.—This company reports that it plans to construct about ½ mile of permanent track.

***Huntsville, Tex.**—Plans for an interurban railway from Huntsville to Brenham are being formulated by the Huntsville Business League through its president, S. S. Felder.

Ogden, Logan & Idaho Railway, Ogden, Utah.—It is reported that this company is contemplating the extension of its line from Preston north through Pocatello, Blackfoot, Idaho Falls and into Yellowstone Park.

Chester & City Point Railway, Chester, Va.—The contract for the construction of this company's line from Chester to City Point and Hopewell has been awarded to the Vaughan Construction Company, Inc., of Roanoke. A 60-ft. drawbridge will be constructed across the Appomattox River in connection with the construction of the line. H. D. Eichelberger, Chester, president. [Sept. 18, '15.]

Petersburg & Appomattox Electric Railway, Petersburg, Va.—It is reported that this company has begun the extension of its line from Hopewell to City Point, about 1 mile. T. M. Wortham, Richmond, president.

Virginia Railway & Power Company, Richmond, Va.—This company will construct a bridge across the Appomattox River to replace the present structure.

Seattle Municipal Street Railway, Seattle, Wash.—The city utilities committee of the Council has recommended the operation of cars on Division "A" of the municipal line from Pine Street over Fourth Avenue to Jefferson Street, instead of to Second Avenue and Washington Street, pre-

viously proposed. The city utilities committee recommends the change in routing to be made because of the refusal of the receivers of the Seattle, Renton & Southern line, from whom common user rights will be obtained, to construct crossovers for cars of the municipal line. It is stated by operating on Jefferson Street only the existing turning wye will be used.

Spokane (Wash.) Traction Company.—Residents of the northeast section of Spokane have asked the Spokane Traction Company to build an extension on Madelia Street from Boone Avenue to Broadway. Plans are now under consideration by the company.

Monongahela Valley Traction Company, Fairmont, W. Va.—Plans are being made by this company to construct a 4-mile loop in East Side, Fairmont. It is reported that work on a new interurban trolley line from the mouth of Limestone Creek to Wilsonburg will be begun at once by this company and that when it is completed Wilsonburg cars will be operated by way of the Clarksburg-Fairmont line and the Adamston-Wilsonburg one abandoned.

SHOPS AND BUILDINGS

Detroit (Mich.) United Railway.—This company has contracted for the steel for its new erecting and wood-working shop at Highland Park. This is the third building in the general repair shop group, two of which have been constructed. The new building will be 238 ft. x 287½ ft. and a part of it will be two stories high. The same type of construction will be followed as was employed in the machine shop described on page 1314 of the ELECTRIC RAILWAY JOURNAL for June 13, 1914. This structure was built with a steel frame, brick curtain walls, metal sashes and concrete floors and roof.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York is advertising for bids, to be opened March 9 at 12.15 p. m., for the completion of construction of station finish at the Hunters Point Avenue station on the Queensboro subway in Queens. The Interborough Rapid Transit Company is now operating trains through the Queensboro subway (Steinway Tunnel) as far as this station, but the finish work upon it has not been completed.

Monongahela Valley Traction Company, Fairmont, W. Va.—Bids will be opened by this company about April 1 for the construction of a passenger and express station at Fourth Street, Clarksburg. The structure will be 70 ft. x 80 ft., three stories high, and will be of reinforced concrete and brick construction. The estimated cost is about \$50,000.

POWER HOUSES AND SUBSTATIONS

Shore Line Electric Railway, Norwich, Conn.—Work has been begun by this company on the construction of a new power house to supply power for the company's line between New London and Norwich.

Rome Railway & Light Company, Rome, Ga.—This company has recently completed the erection of a 2300-volt transmission line to various parts of the city and suburbs.

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—The Public Utilities Commission of Illinois has approved this company's application to extend a transmission line from Chenoa to Lexington.

Kankakee & Urbana Traction Company, Urbana, Ill.—This company is erecting a switch and transformer tower at Paxton, to be used in connection with the purchase of power from the Paxton plant of the Central Illinois Utilities Company. No substation will be built by the company in Paxton. As soon as the present construction work is completed into Paxton the Kankakee & Urbana Traction Company will feed current into the north end of its line, which is purchased from the Central Illinois Utilities Company, in addition to the power which it is now receiving from the Illinois Traction System at Urbana.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—Plans are being made by this company to extend its transmission line from Vinton to Shellsburg and to Reinbeck.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company will construct a high-tension power line to connect its plant at Lowellville, Ohio, with the plant at Ellwood City, Pa.

Manufactures and Supplies

ROLLING STOCK

Alabama City, Gadsden & Attalla Railway, Gadsden, Ala., has purchased a large steel car.

Toronto (Ont.) Civic Railway will receive until March 14 bids on one single-truck double-end city car for its Bloor Street division.

Evanston (Ill.) Railway has purchased three double-truck, fully-inclosed, semi-steel city cars from the St. Louis Car Company. These cars will be equipped with Westinghouse 534-Y3 motors.

Waterbury & Milldale Tramway, Waterbury, Conn., has ordered two semi-convertible double-truck cars from the Wason Manufacturing Company, with a seating capacity for forty-four passengers.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, has ordered two steel, 55-ft. freight cars for the Toledo-Findlay division. A larger car will be placed in operation between Findlay and Mortimer.

Detroit (Mich.) United Railways has ordered fifty more trail cars, of the same type as those recently ordered from the G. C. Kuhlman Car Company. The railway company has also ordered twenty-four interurban passenger cars.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa., expects probably to purchase three double-truck closed cars and a number of open double-truck and single-truck cars to replace those destroyed in its recent carhouse fire.

La Crosse (Wis.) City Railway has purchased seven double-truck, fully-inclosed, semi-steel city cars from the St. Louis Car Company. These will be equipped with Westinghouse 534-Y3 motors and St. Louis trucks. C. F. Speed, general manager Evanston (Ill.) Railway, will supervise the construction of these cars.

Wisconsin Railway, Light & Power Company, Winona, Minn., has purchased four single-truck, 31-ft. body, semi-steel cars from the St. Louis Car Company. These will be equipped with General Electric motors and control. C. F. Speed, general manager of the Evanston (Ill.) Railway, will supervise the construction of this equipment.

Northern Ohio Traction & Light Company, Akron, Ohio, noted in the ELECTRIC RAILWAY JOURNAL of Jan. 22 as having ordered fifteen all-steel city and ten semi-steel interurban cars from the St. Louis Car Company, has specified the following details for this equipment:

	City Cars	Interurban Cars
Seating capacity	56	56
Weight of car body only..	16 tons	13 tons
Length of body.....	42 ft.	42 ft.
Length over vestibule.....	53 ft.	53 ft.
Width over sills.....	8 ft.	8 ft. 6 in.
Width over all.....	8 ft. 6 in.	8 ft. 8 in.
Height, rail to sill.....	36 in.	41½ in.
Body.....	Semi-steel	All steel
Interior trim.....	Mahogany	Steel
Headlining.....	Agasote	Agasote
Roof.....	Arched	Monitor deck
Airbrakes.....	West.	West.
Axles.....	Carnegie	Carnegie
Car trimmings.....	Dayton	.....
Control.....	Type K	G. E. Type M.
Couplers.....	Tomlinson	Tomlinson
Curtain fixtures.....	Acme	Cur. Sup. Co.
Curtain material.....	Pantasote	Pantasote
Destination signs.....	Elec. Ser. Sup. Co.	Ry. design
Fareboxes.....	Cleveland	Cleveland
Gears and pinions.....	Tool steel	Tool steel
Gongs.....	Dedenda	Dedenda
Hand brakes.....	Peacock	Peacock
Headlights.....	Crouse-Hinds	Crouse-Hinds
Journal boxes.....	Symington	Symington
Motors.....	4-West-307, out-side hung	GE-240, inside hung
Paint.....	Sherwin-Williams	Sherwin-Williams
Seats.....	St. Louis, rattan	H. & K. plush and leather
Trolley base.....	O. B.	O. B.
Trucks.....	Brill 27 FE 1	Brill 27 MCB 2
Ventilators.....	Scullin	Automatic

TRADE NOTE

Elwell Trolley Frog Company, Los Angeles, Cal., reports that the Pacific Electric Railway, Los Angeles, Cal., has

more than 1500 high-speed Elwell trolley frogs in service, and during the past five years fewer than ten have required renewal. This type of frog was described in the issue of the *ELECTRIC RAILWAY JOURNAL* for Feb. 19, page 374.

ADVERTISING LITERATURE

Carlisle & Company, New York, N. Y., have issued a booklet entitled "Tungsten, Its Properties and Uses."

Railway Storage Battery Car Company, New York City, has issued a catalog which contains operating data showing the low cost of operation on a number of railways which are using self-propelled passenger cars equipped with the Edison non-acid storage battery for motive power.

Thew Automatic Shovel Company, Lorain, Ohio, has issued a number of circulars describing its automatic shovels. One bulletin is devoted in particular to electric railway shovels. It describes the advantages and operating principles of electric shovels and contains data of their performance.

Sherwin-Williams Company, Cleveland, Ohio, has issued a catalog which contains useful samples of its various types of Old Dutch railway enamel shades, generally used for car painting. The catalog also contains helpful instructions for the application of its railway enamel with regard to new or burned off work, or for old work, or reshoping.

National Tube Company, Pittsburgh, Pa., has issued a seventy-two page booklet, printed in three colors, which embraces a list of the "Kewanee" specialties manufactured by this company. The bulletin contains a complete list of these specialties and shows instances of their satisfactory use. It also gives a list of the various types of literature issued by this company and descriptive of its different products.

Western Electric Company, New York, N. Y., has issued the sixth edition of its complete little handbook "How to Figure Illumination." This booklet lists complete tables and full illuminating data and illustrates and describes with complete characteristics all the various sizes and styles of "Sunbeam" Mazda lamps. The information contained in this booklet, together with curves and illustrative matter, is sufficiently complete to enable one to lay out any illumination plan.

Whiting Foundry Equipment Company, Harvey, Ill., has issued a catalog describing and illustrating its cupola for melting scrap iron, such as car wheels, cast-iron rail joints, etc. One of the chief advantages claimed for this cupola is that of fuel economy, resulting from a diffused blast arrangement. Softened blast tuyeres are used. The air, introduced in large volume at a moderate pressure, enters around the entire inner circumference of the cupola, and thus effects a large saving in fuel. Owing to the unequal distribution of the blast the uneven burning of the coke is avoided, and a softer, smoother texture of iron, desirable for machine castings is produced. Quick melting is another feature of this cupola construction. This company has also issued Catalog No. 119, describing its air hoists.

Bureau of Labor, Government of Porto Rico, San Juan, P. R., has issued a circular letter for merchants in the United States interested in the South American trade, which announces that this bureau has enrolled on its lists a great number of young men qualified as stenographers, bookkeepers, translators, salesmen, etc., who speak both English and Spanish and are equipped by their training in American high schools, and also in other private schools of commerce, to render an efficient service in these lines. The circular urges American merchants to start a vigorous campaign in Latin America by printing not only their correspondence, but catalogs, advertising, etc., in Spanish and Portuguese, and by selecting from the Portuguese and Spanish-American people a reliable, capable and intelligent personnel, which possess a thorough knowledge of business methods of both the United States and Latin America.

Auger Bit Company, Lebanon, N. H., has issued a catalog and sheet describing the Caldwell high-speed "Z" twist auger bit, useful for linemen and in repair shops. The twist in this auger bit is strong, as the edges are made to carry the strain. The center is light to allow chip passage. The screw is coarse and made double, giving double speed. The construction of the twist keeps the chip constantly close

to the center and away from the edges. In this way the chip passes out in an orderly manner without crowding and choking. The side lips insure a smooth hole. A rib is provided in the inner edge of the twist so that one corner of the chip, which usually travels in half sections, is kept from coming in contact with the wall of the hole. The other edge of the chip rests on the inclined plane, which acts directly against the chip as a conveyor. Were it not for the provision of the rib, one end of the chip would strike the wall of the hole, become retarded in its progress and prevent the passage of the following chips, creating excessive heat.

D. & W. Fuse Company, Providence, R. I., has issued a 4¼-in. x 7-in. booklet which shows that the company is fully alive to the needs for high-grade fireproof wiring. The modern developments described and accompanied, where necessary, by a wire table, are as follows: Round magnet wire; flat and square magnet wire; stove wire for wiring of electric stoves and ovens and in boiler rooms or other places where excessive moisture is not present; stranded conductor fixture wire, an asbestos wire superior to rubber for high temperatures, as in car fixtures; stranded conductor fixture wire with silk covering for exposed work; stranded conductor heater cord with rubber insulation; solid conductor switchboard wire; stranded conductor moving picture machine cable, available for railway controllers, searchlights and other high temperature conditions; stranded conductor duplex cable, also for the last mentioned purposes; solid conductor lead-sheathed cable for salt moisture conditions especially. The booklet also contains a supplement on Deltatape, Delta sheeting, Delta insulating varnish and Delta plastic compound and a price list of Deltabeston magnet wire.

Alexander Milburn Company, Baltimore, Md., has issued a catalog describing and illustrating its portable acetylene light. One of these types, especially adapted for use by emergency and line crews of electric railways, burns with a strong flame, concentrated by a deep 10-in. polished aluminum reflector, to give 4000 cp. and throw light 500 ft. Two swing joints on the burner pipe permit this light to be directed instantly at any angle without tipping the lamp. The flame may be regulated by a cock and is kept smokeless by an air-mixing reflector holder. A letter reproduced in the catalog reports satisfactory service from these lights on the Hudson Valley Railway, Glens Falls, N. Y., where they are used mostly for repair work on high-tension lines. In locating trouble the patrolman carries the light as he patrols the line. When making repairs this company uses two lights, setting them on the ground about 75 ft. on either side of the work. This gives ample light to work on top of the highest pole, practically as well as in broad daylight.

NEW PUBLICATION

Railway Regulation. By I. Leo Sharfman. La Salle Extension University, Chicago. 230 pages. Limp leather, \$2, postpaid.

This book is a very readable digest of the leading problems in railway economics from the point of view of government regulation in the United States. While the author has confined his attention to the steam railroad aspects of regulation, most of the bigger principles discussed are equally applicable to electric railways. Mr. Sharfman's discussion of valuation is simply a summary of existing theories, with the statement that the present steam railroad valuation will doubtless result in a substantial contribution to the proper solution of the many railroad valuation problems. It is interesting to note that in the matter of state *versus* federal regulation for steam railroads, the author believes that the prevailing national character of American commerce and industry obviously necessitates a single unified control in the hands of the federal government, and that it is not unlikely that the chief future uses of the state commissions will be found in connection with the local utilities, for whose control such bodies are tending to dominate, if not to replace entirely, municipal regulatory bodies. The book as a whole is particularly designed to be useful to railroad men and shippers, but it should also appeal to anyone desiring a general résumé of the relations between government and transportation.