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SAVINGS BANK INVESTMENTS

Preparedness is the order of day, and the Investment Bankers' Association of America has not failed to do its share. Foreseeing the time when utility bonds will more generally join the select list of savings-bank investments, the association has outlined certain fundamentals that should aid state legislatures in framing new eligibility laws. The move is wise, for with the present low yields on many legal investments it is quite likely that savings banks will increasingly turn elsewhere to secure the necessary income, and the record of utility bonds entitles them to recognition first. Criticism can hardly be directed against the spirit of the proposed standards, for they are meant to insure only that fair margin of safety, that reasonable relation of property value to bond issues and that justified directness of lien which are demanded by sound financial policy. The real test of the standards, however, must come from their application to actual conditions, and here electric railways and other utilities have a double duty to perform. They should give to their financial reports the uniformity and clarity desired by investment bankers, and they should aid the bankers by applying the standards to their own bonds. If deserving issues are excluded thereby, the bankers want to be so informed, and their request should be granted without delay.

ENCOURAGING FARE INCREASES

Three New England decisions authorizing fare increases above the 5-cent unit to 6, 7 and even 8-cent bases, as noted in the issue of Oct. 14 and elsewhere this week, are most encouraging evidence that the financial necessities of electric railways are becoming more and more appreciated by commissions. Two of these findings concerned interurban roads in New Hampshire serving Manchester, Nashua and Derry in close competition with the Boston & Maine Railroad. The third decision affected the Massachusetts Northeastern Street Railway, the rehabilitated "Lovell" system of the Merrimac Valley. In all these cases the commissions found that the companies were not earning anything like a fair return upon an honest investment, and that the requirements of depreciation as well as the rights of the security holders justified the proposed increases, since all three roads were found to be operated efficiently. Service rendered at a loss, or even at an income barely meeting running expenses and bond interest, was regarded as worthy of better compensation. It is interesting to note that in judging the fare units one commission drew a sharp distinction between the problems of the city road and those of the country or inter-

urban electric railway. Moreover, a very significant utterance is the one of the Massachusetts commission, which states that a company which has foregone dividends for a considerable period in order to provide adequately for maintenance, has an excellent claim for a return upon its common stock materially higher than 6 per cent. All in all, the decisions bear every evidence of thorough and courageous work on the part of the commissions, and indicate a sane understanding of electric railway economies.

LOOKING TO THE FUTURE

Although in the last few years various commissions have granted increased fares to electric railways, as in the three recent instances above noted, the public as a whole is still far from being disabused of the idea that it is entitled to a fixed 5-cent fare, regardless of the rising costs of production. Especially is this true of urban transportation. For this reason we welcome every speech, decision or practice that tends to keep the concept of "cost" before the public mind, while at the same time we must deprecate all movements involving a neglect of this concept. In the latter regard a pertinent example is that of the abolition of the 8-cent exchange tickets under the proposed Philadelphia rapid transit ordinance, mentioned in the issue of Oct. 14. Some of these tickets may have been discriminatory, but on the average they probably no more than paid for the service rendered. The burden of their abolition may be lightened or removed by sinking fund and tax concessions, but the departure from principle is still there. In abolishing such tickets in the interest of a flat nickel fare, the proposed ordinance tends to disregard that fundamental cost principle which is certain to demand more open consideration in city transportation before the expiration of the fifty-year life of the ordinance. In this and other cases of outlining a transportation policy for years to come, it is hardly wise to allow present-day customs fully to restrict the future development of progressive ideas. It is as important to cities as to railways that the latter have at all times the assurance of an opportunity for untrammelled growth without having to pay for the privilege of serving the public.

THE VEHICULAR TRAFFIC MENACE

It is noteworthy that at both the National Safety Congress, last week in Detroit, and at the Claims Convention, the week previous in Atlantic City, special attention was directed to the growing menace to safety in the streets from automobile traffic. With the Ford factory turning out cars at the rate of more

than 2000 per day and other factories in proportion, it is no wonder that the effects of traffic congestion are being found in our large cities. Another serious factor of the situation is that with such a multiplicity of cars, all degrees of recklessness in driving may be expected. Obviously the danger is not confined to any one class of occupants of the street. All are involved—the pedestrian, the local railway company and the users of all other vehicles. Hence, in its demand for some amelioration of this growing evil, the railway company is not acting alone. In this effort it should, and we believe will, receive the hearty support and assistance of all. The remedies are not so easy to enumerate, but some are obvious. They should begin with better control of vehicular traffic, stricter discipline of careless vehicle drivers, and more rigorous requirements for driver licenses. With these regulations there should be some means for reducing the parking evil in the more congested streets, forbidding the practice in many of them and possibly excluding automobiles entirely from the most congested streets, at least during certain hours. While, as we have said, all classes of the community are concerned in these reforms, the railways which are so vitally concerned can well lead the movement.

INTERURBANS IN THE LIGHTING BUSINESS

The sale of electric energy by interurban railways to the small towns along their routes, as outlined in our leading article of this week, has been demonstrated to be a thoroughly effective means for increasing revenue. Although the returns from any one community may appear at first glance to be petty, the aggregate may easily constitute an appreciable fraction of the railway company's income, and under proper conditions the business should be very much more profitable than transportation.

In the performance of this service an interurban railway has the primary advantage of an existing transmission system that frequently is supplied from a power station of considerable size, and it is therefore able to offer lower rates than a small local lighting plant. In addition, the influence of the diversity factor makes it just as logical for the interurban railway power station to supply small lighting systems as it is for large lighting and power companies to furnish energy for small railway properties. From the standpoint of theoretical economics, perhaps, the ideal arrangement would be that where a large power company extended a network of line to supply a whole district, including railways as well as the towns within a wide radius, as is done in western New York. But, unfortunately, such conditions are the exception rather than the rule, and there are many communities wherein the only source from which electric light and power may be obtained is either the interurban railway that passes through the town or a small and inefficient isolated central station. Of the two the railway is infinitely preferable.

Apparently, entry into such a lighting and power business is one of the easiest things that an interurban railway can do. All that seems to be necessary is to

express a willingness to supply energy and the community does the rest. There is, however, one feature that is worthy of careful consideration, and that is the making of rates. These must be in such form that, no matter what vagaries the all-important element of load factor may assume in the future, the business may always be conducted at a profit. At the present time, when many interurban railways have surplus generating capacity, it is possible for a company to make extraordinarily low rates and still show a profit. But such conditions will hardly obtain five or six years hence, and a company that undertakes long-term lighting contracts at low rates merely to dispose of surplus power that it happens to have immediately available is likely to be deceiving itself as to the future success of the enterprise.

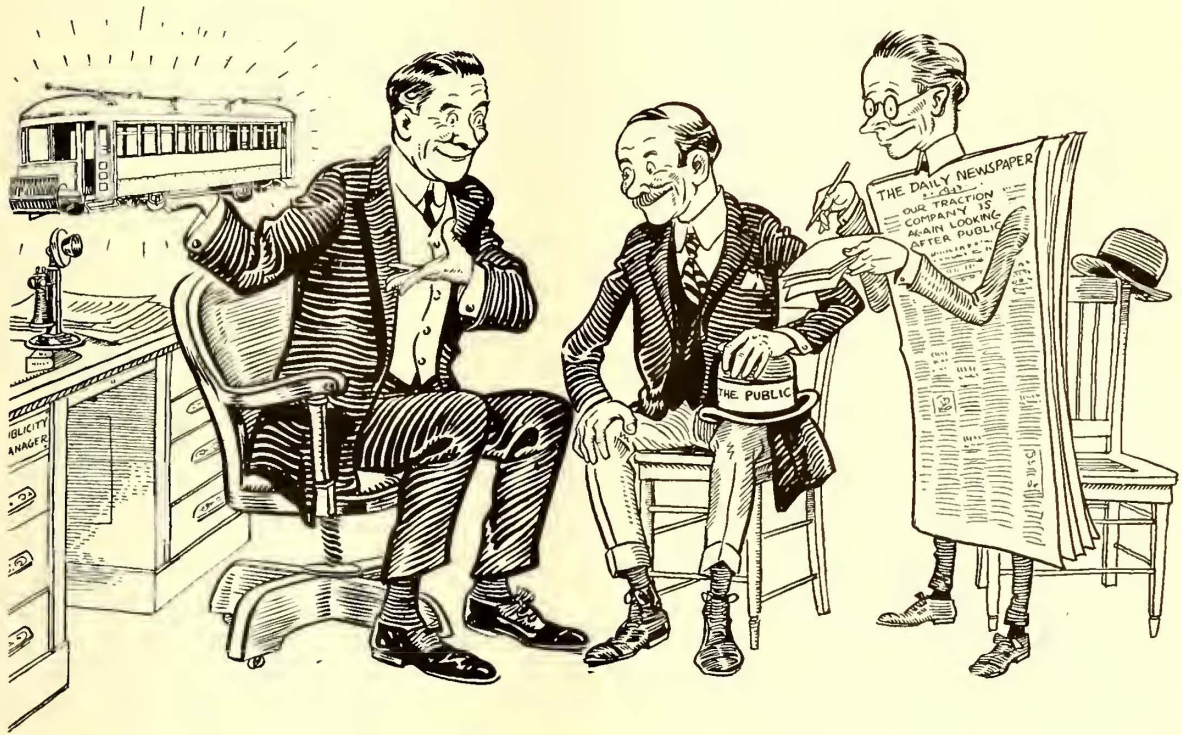
USING REBUILT EQUIPMENT

The high prices and slow deliveries which have prevailed relative to new equipment of all kinds during the last two years have led many electric railways to rebuild and place in active service old rolling stock equipment that otherwise would have found its way to the junk pile. Old motors are heavier and less efficient and cost more to maintain than do new ones. Old cars, while they may, in some cases, be equipped with modern safety devices and made fairly presentable at a reasonable cost, after all are not as good as new. While the operating and maintenance charges, measured in cents per car-mile, are therefore higher for rebuilt than for new equipment, the use of rebuilt equipment for certain services may in some cases be justified from an economic standpoint.

This is particularly apt to be true for equipment used in rush-hour and special services on small and medium sized roads where the peak-load periods are of short duration. And the reason is high fixed charges, or charges such as interest, taxes, depreciation, etc., which go on accumulating whether the wheels turn around or not. For new equipment these charges, measured in cents per car-mile, are higher than one might expect. For example, on a \$4,500 car operated two hours per day at a schedule speed of 8 m.p.h., and with the sum of these charges assumed as 16 per cent of the cost, they are approximately two and one-half 5-cent fares per car-mile. And with the present interest and tax rates and rapid evolution in car design, 16 per cent for fixed charges is not by any means excessive.

In a steam power plant which is used in reserve service and carries load for only a few days in the year, economy in operation and low maintenance costs are of little importance as compared with low fixed charges. As with the reserve power plant so it is with rush-hour equipment, it being, of course, assumed that the matter of reliability always has due consideration. In any event, good engineering dictates that before a change of any kind is made, whether in the way of supplanting old equipment with new or of rebuilding the old, the costs entering into the proposed change should be correctly counted.

What Is a Publicity Man?



W. J. ENRIGHT

The Publicity Man Discussing Matters with the Public and the Press

TO make a rabbit pie it is first necessary to catch your rabbit.

It is the same with publicity; you must first catch the right man to make the campaign.

If you do not happen to have an embryonic E. H. Gary on your staff, a publicity man is most likely to be found in a local newspaper office.

But all newspaper men are not good publicity men.

A lot of disappointment has been caused by the hiring of reporter press-agents on the vague theory that they know the newspaper game.

Don't hire any man unless he has **ENOUGH SIZE AND WEIGHT** to make his superiors allow him to do the right thing in spite of their prejudices and previous habits in dealing with the public.

The publicity man who merely gives out what is handed to him by his boss isn't worth having around.

Neither is the man who thinks of his work only in the terms of what, from the newspaper point of view, is a good story.

The successful publicity man must have the corporation as well as the newspaper viewpoint.

And he must be big enough to be taken into and **MADE A PART** of a public utility organization. Just as much a part of it as the general counsel.

The worth-while publicity man must ask himself every day: What's wrong? What's right that people think is wrong?

What is complained of that is not our fault? How can I prove it?

And then he must prove it, and re-prove it and then prove it again.

He must plan, prepare the public mind for things to come and make the newspapers want to come to him before they go off half cocked.

These are some of the things that a publicity man is and must do.

He is not a miracle worker; he can't suppress news or put anything over on the newspapers.

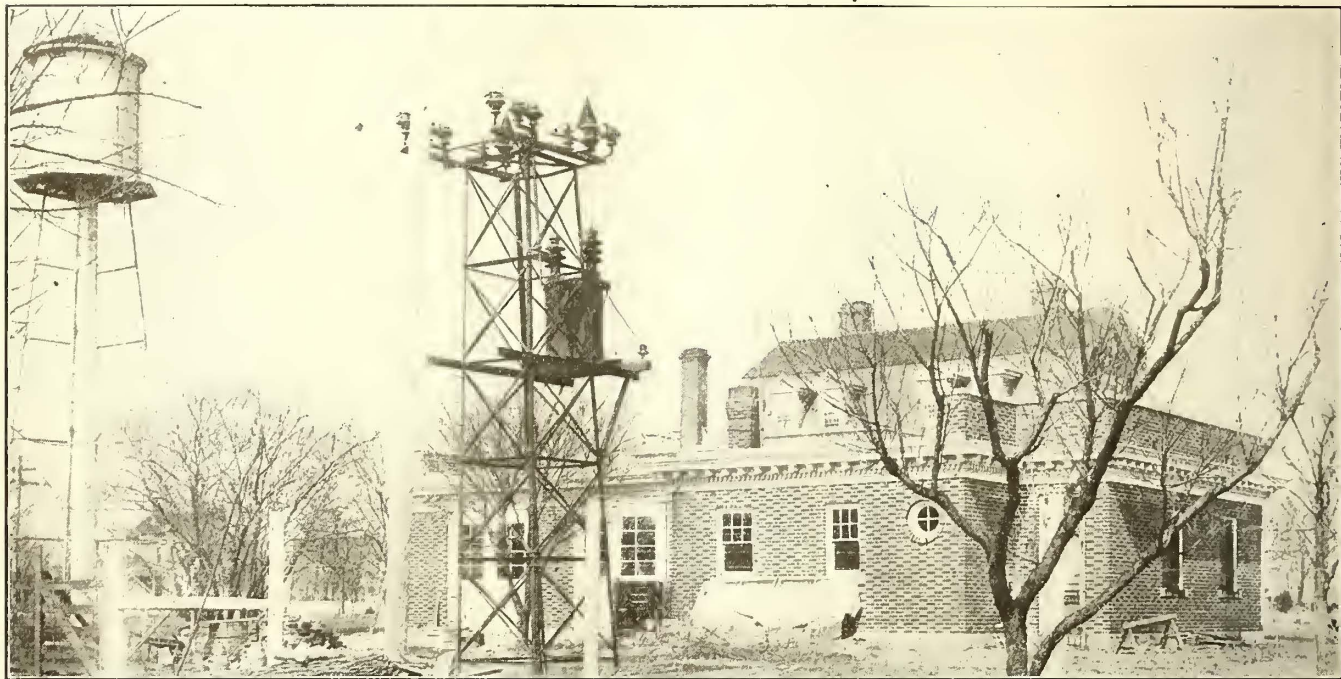
He can't change hostile public opinion in a day.

But he can, if you will give him a chance, secure for any decently-conducted corporation a square deal from press and public.

EVERY PUBLIC SERVICE CORPORATION NEEDS A PUBLICITY MAN IN ITS BUSINESS.

Selling Energy Along Interurban Railways

A Number of Interurban Roads Have Undertaken to Furnish Electric Power for Lighting and Industrial Use in Small Towns Along Their Routes—Invariably This Business Has Been Profitable and No Special Effort Has Been Required for Its Development and Continuance



INTERURBAN POWER SALES—TEN-KILOWATT FARM SERVICE SUBSTATION ON OHIO ELECTRIC RAILWAY

THE sale of energy for light and power by interurban railways to the communities that they serve has proved to be a desirable and profitable field of development, and at the present time it is being cultivated in all of the Central States. Although there has been some competition, the fact that the railway was initially serving the community has, in most instances, given it a special advantage in furnishing the additional service, and since the load carried at an interurban railway generating station frequently has no sustained peaks, the railway is in a better position to supply energy at low yet profitable rates than is a company designed only to furnish light and power.

Generally speaking, there is no difference of opinion as to the desirability and profitableness of energy sales by electric railways, but there is considerable disagreement as to how to go about obtaining this business. This is, perhaps, due to the fact that its development is comparatively recent. As a matter of fact the business depression of the past two years or more has awakened many managements to the great possibilities of supplying this profitable service in which a minimum investment is required. Contracts for supplying energy to wholesale and retail consumers vary from the plan usually followed by lighting and power companies, where energy is retailed to individuals. Instead, it is customary merely to supply a community or an industry from a tap to the railway transmission lines. Under the latter plan the consumer carries the entire investment charge, including the cost of transformation and the distributing plant, and the railway company agrees to furnish energy at a given potential when power is on the lines. Occasionally competition has forced the

railways to assume the cost of stepping down the potential to the consumer's distributing system, and in a few instances some companies have even been compelled to retail the energy to individuals in order to obtain the business. In any case, however, the rate is based upon the investment, transformer and line losses, and a proper proportion of the cost of delivering the energy to the high-tension lines.

Comparatively few companies have found it necessary to add to the generating capacity already provided to care for the railway peak loads. As a matter of fact, most companies have found that the sale of surplus energy for this purpose has tended to improve the load factor where sufficient business has been obtained.

The amount of such business contracted for by different railways produces a gross income varying from \$10,000 to more than \$500,000 per annum, and in some instances the lighting and power load at the generating station equals that used by the cars, the railway load on one property making up only one-third of the total output of the station. Where the energy is sold by a contract requiring no investment on the part of the railway, the ratio of profit in the revenue produced by the lighting and power business is large, but even where the rates include the proper allowances to cover fixed charges on the maximum demand, and the railway furnishes the substation equipment, the business has proved profitable.

PRACTICABILITY OF 25-CYCLE ENERGY

To those who have not investigated the results that are being obtained through the sale of energy by electric interurban railway companies, there appears the

objection that energy cannot be furnished at 60 cycles. However, the slightly increased cost of motors and other electrical equipment designed for 25-cycle energy is practically negligible, and in so far as the undesirability of this frequency for lighting purposes is concerned it may be said that the opposite view is held by those who are now using it. Practice has shown that with close frequency regulation at 25 cycles there is no perceptible flickering with tungsten and nitrogen lamps.

In some instances, to close contracts for the sale of energy, it has been necessary for the railway company to provide a motor-generator set, or a frequency changer, but this requirement is rarely encountered. Where a community or a consumer assumes the cost of transformation and distribution, it makes little difference with the railway company what frequency is adopted. As a matter of fact, in a few isolated cases rotary converters have been installed and direct-current energy distributed to consumers. Obviously when such is the case no limitations are placed on the domestic appliances available to purchasers of power.

Another objection sometimes raised to an electric railway entering the power and lighting field is that this business would require the railway company's generating station to furnish a twenty-four-hour service instead of running only eighteen or twenty hours to carry the railway load. Some companies, of course, keep their generating stations in service twenty-four hours to move freight trains over the road during the night, but many of the stations are shut down from about 1 a. m. to 4.30 a. m. Where the latter situation exists it is provided for in the contracts with consumers of energy for light and power, and with the class of business the electric railways have been obtaining, this arrangement has not been found to be in any way objectionable.

Usually when this point is raised by prospective customers it is disposed of by simply calling attention to the low rates that apply to the railway power. In quite

a number of instances direct-current motor installations are served, energy being supplied from the trolley feeders, and such contracts, of course, are accepted only where the fluctuating voltage is not disadvantageous to the consumer.

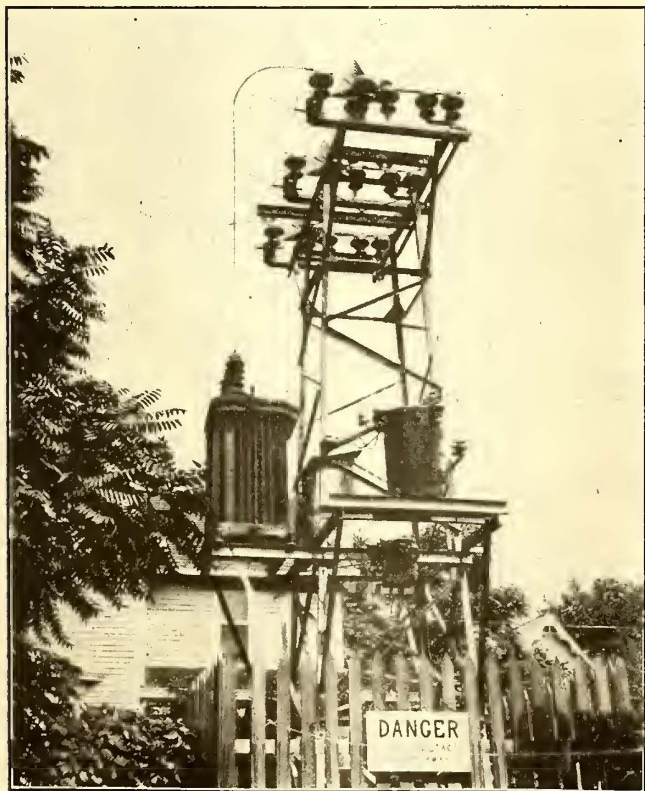
Most of the contracts for energy for lighting and power purposes have been made with municipalities, although there are quite a number of large industrial consumers, and in a few instances individuals have made contracts with both the railway and the municipality to operate an independent lighting company. Where the municipality owns and operates the plant, the rates to the consumers are so fixed that the profit will be sufficient to pay the cost of street lighting, and in some instances, also, to pay for pumping the city water supply.

The rates to make this possible are generally calculated by the railway's engineers, and it is an exception to the rule when there is insufficient profit to provide a sinking fund as well as to pay for the street lighting. When energy is sold in this manner either to municipalities or private parties, the wholesale rates apply and the railway company has only one meter reading to make.

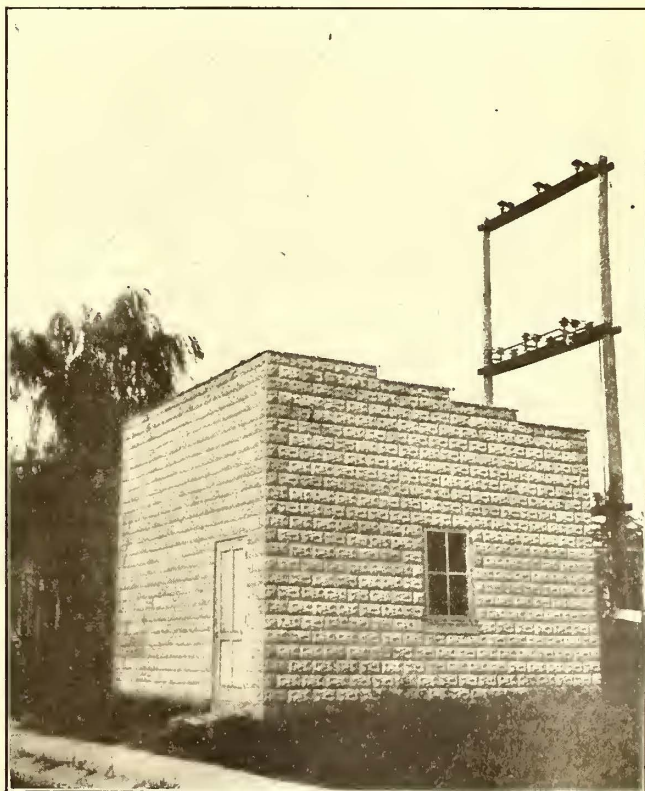
SPECIAL ORGANIZATION UNNECESSARY

Since most interurban railways companies are wholesale producers of energy for their own use, practically no special organization is required either to develop or retain a lighting and power business. It appears to be customary for the electrical engineer and his assistants to devote a portion of their time to supervising the lighting and power development, while the substation inspectors, ticket agents and attendants read the meters and collect the bills, this arrangement being perfectly feasible in small communities where the attendant is not required to leave his station for extended periods of time to read meters.

In the beginning the business of selling energy for power and lighting came to most of the electric rail-



INTERURBAN POWER SALES—TYPICAL OUTDOOR SUBSTATION FOR LIGHTING SYSTEM FOR TOWN OF 450 POPULATION



INTERURBAN POWER SALES—SUBSTATION FOR LIGHTING TOWN OF 800 POPULATION ON LINES OF T. H. I. & E.

ways unsolicited. Even at the present time many companies have adhered to a policy of not actively promoting sales, because it places them in a more favorable position when contracts are being negotiated. Also, many of the communities served by the interurban railways are so small that the available gross business does not warrant the expense of a special department for solicitation.

Aside from the increased revenue to be obtained, it has actually been found that the beginning of contracts for power and lighting has tended to improve public relations in the small communities; particularly so when the railway company's engineers see that the municipal plants are so engineered and the rates so fixed that they can be operated on a profitable basis. Obviously, the interurban railways brought the advantages of the city practically to the doors of the rural communities which they serve, and for them to supply energy for power and lighting to these communities is a thoroughly logical step.

PRACTICE OF AN IOWA RAILWAY IN DISTRIBUTING ENERGY TO MUNICIPALITIES

As an example of the experience and practice of an Iowa road it may be said that the Waterloo, Cedar Falls & Northern Railroad Company has developed, within the past year, a revenue of approximately \$1,000 per month from this source, the majority of the contracts

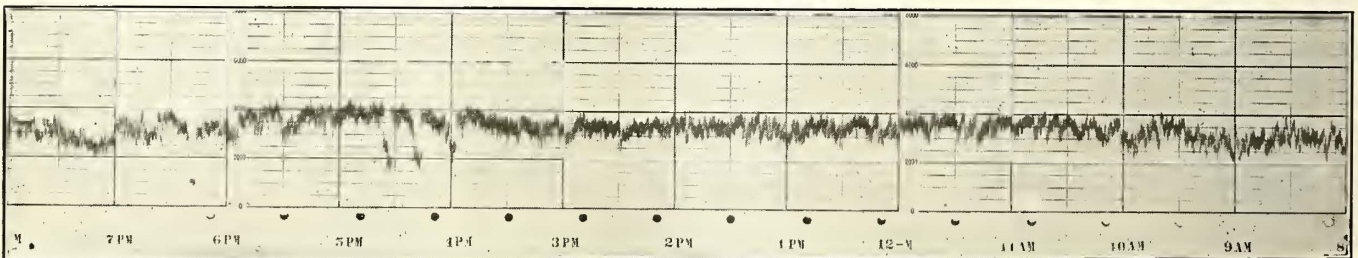
the number of industries in small towns and thus make them self-sustaining.

ILLINOIS TRACTION'S METHODS AND POLICIES

A gross revenue of approximately \$50,000 per year, received in amounts varying from \$50 to \$100 per month, is obtained by the Illinois Traction System, Peoria, Ill., through wholesaling surplus power to communities and industries along its lines, although some direct-current energy is retailed direct to grain elevators. Rates for various services have been standardized by this company and are essentially as follows: Direct-current for grain elevators is sold on a demand-and-energy schedule. The demand charge is \$3.50 per kilowatt and the energy charges range from 6 cents to 1¼ cents per kilowatt-hour. A minimum of \$1.50 per kilowatt of capacity per month is also charged. The wholesale demand charge for alternating current, both single and three-phase, is \$2.50 for the first 20 kw., \$2 for the next 80 kw., and \$1.75 for demands in excess of 100 kw.

To this demand charge is added a secondary charge for energy of 2 cents for the first 1000 kw.-hr., 1¾ cents for the next 3000 kw.-hr., 1½ cents for the next 96,000 kw.-hr., and 1¼ cents for all over 100,000 kw.-hr.

In a few instances three-phase alternating current is retailed for power purposes, and the following demand charges are applied: \$2 for the first 50 kw., \$1.50



INTERURBAN POWER SALES—TYPICAL DAILY LOAD CHART FOR

being for wholesaling energy to municipalities. As a rule the electrical energy for lighting is retailed by the municipality somewhere between 10 cents and 15 cents per kilowatt-hour, a power rate between 5 cents and 6 cents per kilowatt being made also. As an example, the village of Denver, having a population of 500, retails to about 100 consumers energy at 11 cents for lighting and 5 cents for power. The profit from this service pays for the energy used by a 30-hp. motor employed in pumping the village's water supply and for twenty-seven 100-watt street lamps. In the year of 1915 the village obtained a profit over and above all expenses of about \$400.

Under most of its contracts the railway company supplies the transformer equipment in the substation and the community or private corporation distributes the energy to consumers and steps it down where necessary at the distribution centers. Where the transformers are installed between substations the outdoor type of station is used with Burke horn-gap series-resistance lightning arresters with the gap set quite wide so that it arcs only in extreme surges. The experience of this company has demonstrated that when the gaps are close many of the disturbances that occur are really not necessary.

A charge of 8 cents is made for the first 100 kw.-hr. used monthly, 6 cents for the next 100 kw.-hr., and 4 cents for all energy in excess of 200 kw.-hr. This low rate attracts the retired farmer to the small town, the railway profiting by the increased population, and in addition the moderate charges have tended to increase

for the next 450 kw., and \$1.25 for all over 500 kw. A secondary charge for energy is added to this, amounting to 1½ cents for the first 7500 kw.-hr. used, 1¼ cents for the next 7500 kw.-hr., 1 cent for the next 85,000 kw.-hr., 0.9 cent for the next 100,000 kw.-hr., and 0.8 cent for all over 200,000 kw.-hr. These rates are applied only where the capacity exceeds to 50 hp., and a minimum bill of \$1 per month is required. All contracts cover a period of five or ten years. The consumer is required to build lines satisfactory to the railway company and guarantee their condition.

Continuity of service for the lighting and power customers of the Illinois Traction System is insured by a loop transmission system, and practically no business is accepted off of such sections of the company's lines. This arrangement also insures good regulation and a special effort is made to maintain the frequency at least up to 25 cycles, so that there will be no complaints. While some farm service is supplied through privately-owned plants, the railway company has not found the demand sufficient to warrant the installation of transformer equipment to supply individual customers.

It has been found that no additional hazard has been created by taking on this lighting and power business, and that interruptions to the railway service have not been increased thereby. The character of line construction and the installation is supervised by the railway company, hence it is of a known standard. As a protection against interruptions arising from this source, however, a low-voltage automatic switch has been installed in connection with each lighting and power in-

stallation. Lightning protection on the 2300-volt side usually consists of a horn gap and choke coil. Electrolytic lightning arresters are provided on the transmission lines, but the small lightning and power installations do not warrant the use of such expensive protection. The horn gap and choke coil allows occasional interruptions, but these are not sufficiently serious to make the service unsatisfactory.

A twenty-four-hour service is furnished over the entire system because it is necessary to keep the power houses in operation during the night to move the sleeping cars and freight trains over the road. In fact, the power output for the entire twenty-four-hour period is practically a straight line. The demand falls off somewhat about 6.30 p. m.; hence, if the amount of energy sold for lighting were large it would actually tend to improve the generating station conditions between that time and midnight.

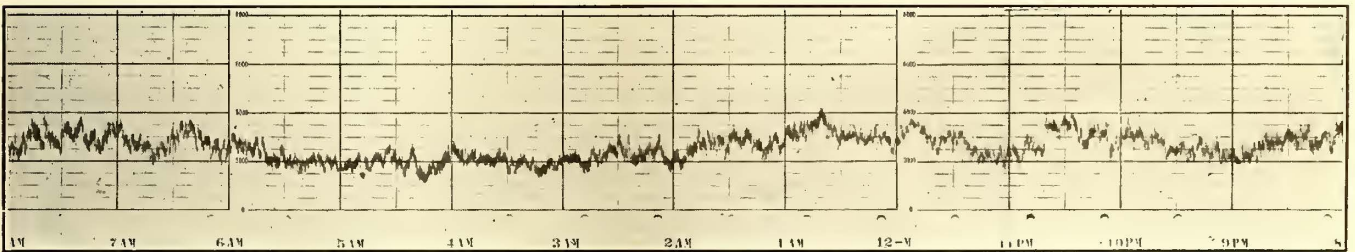
METHODS OF TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

The Terre Haute, Indianapolis & Eastern Traction Company is selling direct current and alternating current both three-phase and single-phase to municipalities, large industries and to a few individual consumers. At the present time this company is selling approximately 70,000 kw.-hr. per month, and it obtains a revenue of approximately \$2,000 a month. The retail rates are as

period of less than five years. As a rule, under these special contracts, which are termed off-peak-load contracts, the railway company installs the necessary transformers and other equipment.

For the development of this lighting and power business the superintendent of distribution and substations keeps in touch with prospective customers through his division foremen and by occasional personal calls. With the permission of the management he is frequently appointed the engineer for the municipality, prepares the plans and specifications, and inspects the completed installations, which, as a rule, are put in under contract. This arrangement has been found very satisfactory, because the municipality pays the company's engineer for his work and, at the same time, the engineer is in a position to see that an installation is provided that is satisfactory to the railway company as well as to the community. It tends also to bring the railway representatives into close personal relations with the community, which also redounds to the company's future good.

In practically every instance where the railway has contracted with a municipality to furnish energy for lighting and power purposes, the municipality has paid the entire cost of the installation including the transformer equipment, but excepting the cost of the tap to the transmission line. These contracts also do not provide for a twenty-four-hour service. As a rule the maxi-



RIVERTON POWER STATION OF ILLINOIS TRACTION SYSTEM

follows: Up to 25 kw.-hr. per month a charge of 10 cents per kilowatt-hour is made; for from 25 to 50 kw.-hr. per month a charge of 9 cents per kilowatt-hour is made, and the charge for 50 kw.-hr. or more per month is 8 cents per kilowatt-hour. A cash discount is allowed for payment before the tenth of the month, which begins with 5 per cent for amounts less than 100 kw.-hr., with an increase of 5 per cent in the amount of the discount for each increase of 100 kw.-hr. per month from 100 kw.-hr. to 600 kw.-hr., and a further graduated increase in the discount in 200 kw.-hr. steps from 600 to 2000, where a discount of 50 per cent is allowed. In connection with these rates a minimum of 50 cents per rated horsepower per motor is charged, but in no instance is the minimum charge per month less than \$2 for any one installation.

Wholesale energy rates are based on a yearly guarantee. Thus, a purchase of \$500 per year gross receives a rate of 4 cents per kilowatt-hour; a purchase of \$1,000 per year receives a rate of 3½ cents per kilowatt-hour, and \$1,500 per year gross receives a rate of 3 cents per kilowatt-hour. Aside from these wholesale and retail rates, special contracts are made with large industries based on the maximum demand. There is charged a rate of 1¼ cents per kilowatt-hour for the first 5000 kw.-hr. per month, 1.6 cents per kilowatt-hour for the second 5000 kw.-hr. per month, and 1.5 cents per kilowatt-hour for all over 10,000 kw.-hr. per month. A readiness-to-serve charge of \$1 per kilowatt per month is added, and no contract is accepted at these rates for less than 100 kw. of maximum demand for a

num time during which the energy is off the line is between 1 a. m. and 4.30 a. m. In addition to carrying the investment charge on the transformer equipment, the community is charged for the transformer core losses, while the railway assumes the cost of the copper losses. The fact that the transformer core losses will in most cases amount to a great deal more than the revenue for energy sold during the period that the power is off the lines, furnishes an excellent argument against all-night service in small communities.

Incidentally, it has been this railway's experience that consumers in the small villages along its lines buy electrical service from municipal plants more readily than they do from privately-owned plants. The success with which these municipal plants are meeting perhaps is best evidenced by producing facts from their annual statements. A municipal plant was completed and put in service on Dec. 23, 1915, at Lewisville, Ind., a village of 450 population. On Aug. 1, 1916, 100 meters had been installed, although there are only 125 houses in the town. The village of Advance, Ind., with a population of 416, has installed 105 meters and collected a gross revenue of approximately \$1,500 for the year 1915. The total cost of this municipality's plant was approximately \$7,500, and the amount paid to the railway company for energy was, in round figures, \$640. The difference between the collections and the amount paid the railway company, which included the energy used by twenty-two 150-watt and 250-watt street lamps, left \$860 with which to pay interest on the investment. The village of Coatesville, Ind., with a population

of 470, has 165 consumers which produced a gross annual revenue of \$2,185 in 1915. After deducting the amount paid the railway and that spent in maintaining the system, approximately \$620 was left with which to pay interest on a plant costing approximately \$5,700. The village of Centerville, with a population of 800, has 187 consumers which produced an annual revenue of \$2,160 in 1915. The expense of operation, including the cost of energy purchased from the railway and the current consumed by thirty-three 100-watt and 200-watt street lamps, was \$2,040. The plant in this instance cost, in round figures, \$7,450.

The equipment installed for these light and power installations, either in the company's substations or where the current is taken direct from the high-tension line, is standardized as far as the requirements of the community will permit. When energy is supplied from a substation, the secondary voltage is usually stepped



INTERURBAN POWER SALES—EQUIPMENT IN INDIANA SHALE QUARRY OPERATED BY D.-C. MOTOR ON INTERURBAN TROLLEY CIRCUIT

up to 2300 volts by small transformers, located, as a rule, outside of the station. In some cases, however, where the substation is located within the town, the secondary voltage of approximately 370 volts is stepped down to 220 volts, or 110 volts by transformers outside the substation, and distributed by a three-wire system.

RESULTS ON OTHER INDIANA RAILWAYS

The Union Traction Company of Indiana also is furnishing energy for light and power to twenty-six municipalities, varying in size from 200 to 1500 population. Through a subsidiary company franchises have been obtained in twenty-three of these towns for retailing energy to individual consumers. In two cases the energy is sold wholesale to municipalities, and in another it is sold to private corporations which distribute to the individual consumers. The gross revenue obtained from this source is about \$45,000 per year.

The Fort Wayne & Northern Indiana Traction Company and its subsidiary, the Wabash Valley Utilities Company, which distributes to communities not located on the interurban railway divisions, has developed the sale of energy for light and power purposes until it receives a gross income of approximately \$500,000 a year. This energy is sold outside of Fort Wayne and La Fayette to communities varying in size from 200 population up to more than 2000. Energy is sold at an established rate of 10 cents per kilowatt-hour for lighting service, and power rates vary, dependent upon the demand, down to as low as 2 cents per kilowatt-hour. This company furnishes a twenty-four-hour service to all consumers, because its plants are in operation for that period to supply energy to Fort Wayne and La Fayette for lighting and power purposes.

The Indianapolis & Cincinnati Traction Company supplies energy to eleven lighting plants in small towns and villages, and a number of motor installations in grain elevators are supplied at 3300 volts direct from the single-phase trolley. In all cases but one this company deals direct with the consumer, and it installs the transformation and distribution systems. A retail residence lighting rate is made to all communities as follows: Ten cents per kilowatt-hour for all energy up to 25 kw.-hr. per month, and 8 cents per kilowatt-hour for all energy in excess of 50 kw.-hr. per month. A minimum charge of \$1 per month is made to all consumers, and a discount of 1 cent per kilowatt-hour is made to all those who pay within the ten-day period. The special rate for power is as follows: Energy used up to 100 kw.-hr. per month is sold at 7 cents; 100 kw.-hr. per month and less than 300 kw.-hr. is sold at 6 cents; 300 kw.-hr. per month and less than 500 kw.-hr. is sold at 5 cents; 500 kw.-hr. per month and less than 1000 kw.-hr. is sold at 4 cents, and 1000 kw.-hr. per month and over is sold at 3 cents. In connection with these rates a cash discount of 5 per cent is allowed on all bills if paid within ten days after the meter reading date, and a minimum charge of \$1 is made for any installation.

PRACTICE OF WESTERN OHIO RAILWAY

Undoubtedly the most extensive sales of energy for light and power made by an interurban railway in the Central West are those of the Western Ohio Railway Company, whose railroad load makes up less than 50 per cent of the total. The output of energy for power and lighting purposes is about 2,500,000 kw.-hr. per month, one customer taking approximately 1,000,000 kw.-hr. per month. The question of rates for energy is regulated by the State Public Utilities Commission, and most of the energy is sold to individual consumers. Even though the amount of energy sold for lighting and power is greater than that used by the railway, this company has no special organization for soliciting or maintaining it. Generation is under the supervision of the electrical engineer, and the distribution and development is taken care of by the superintendent of overhead lines.

This company does not encourage the use of direct-current motors, because of the marked fluctuation in the trolley voltage due to the heavy freight service. In practically all cases energy is supplied at the standard voltages, single phase or three phase. Where it is necessary for the railway to operate the plant as a light and power company in order to obtain the business, it does not hesitate to make a contract; but where the energy can be sold to the municipality wholesale, or to a private corporation, this is also done. Competition in the territory served by the Western Ohio Railway has been rather keen in some localities, hence it has been

necessary to adopt this broad policy regarding the service. Energy is retained in eight small towns at 25 cycles, but in some of the larger cities, particularly where old plants have been displaced, it is necessary to supply the energy at 60 cycles. Practically all of these contracts are made for a period of ten years with an option for renewal, and a twenty-four-hour service is furnished. It is also interesting to note that while most other railway companies have not extended their transmission lines beyond their rights-of-way, this company has two branch transmission lines, one seven miles in length and the other five miles.

Although this company generates energy at a single power house, interruptions to the lighting and power service are comparatively infrequent. The reliability and continuity of this service are maintained at a high standard by careful and frequent inspection of all the transmission lines, and especially the insulators.

Rates for power and commercial lighting range from 4 cents down to 2 cents net per kilowatt-hour, the latter applying to customers using more than 3000 kw.-hr. per month. There is no monthly minimum charge. For domestic or residence lighting the rate ranges from 8 cents net per kilowatt-hour down to 3.5 cents, with a minimum charge of \$1 per month. Wholesale rates to electric railroads or resale companies with a connected load of 100 kva. or over, range from 2 cents per kilowatt-hour down to 1.1 cents when more than 450,000 kw.-hr. are used.

RATES OF OTHER OHIO ROADS

Energy is supplied to eighteen towns and villages, and a number of other manufacturing and individual customers along the lines of the Ohio Electric Railway. The total amount of energy sold during the month of June, 1916, was 128,283 kw.-hr., the maximum to any one customer being 26,550 kw.-hr., and the minimum 690 kw.-hr. Three schedules of rates have been promulgated, namely, a wholesale rate for villages where there is a single installation of 25 kw., a wholesale rate to villages where there is an installation of 50 kw. or over, and a retail rate to small communities where the railway company provides the distribution system and sells direct to the consumer. Where the village is incorporated the energy is sold to the village authorities, but where it is unincorporated energy is sold direct to the consumers. In a few instances a rural lighting and power business is being developed by paralleling the railway's overhead lines with a 440-volt or 220-volt single or three-phase line mounted on the same poles. One 12-mile installation of this kind has worked out very satisfactorily.

The rates for the three classes of service furnished by this railway are as follows: Where there is a single installation of 25 kw., for the first 100 kw.-hr. consumed the rate is 8 cents per kilowatt-hour, and this ranges down to 4 cents for amounts in excess of 1000 kw.-hr. There is a minimum charge of \$50 per month. For an installation of 50 kw. or over the charge is \$1 per kilowatt of transformers installed plus 2 cents per kilowatt hour. There is a discount allowed on bills if paid before the fifteenth of the month. On bills of \$400 or less per month this amounts to 5 per cent, and it ranges up to 20 per cent on bills over \$500 per month. The schedule for retailing current in small communities includes a rate, for the first 30 kw.-hr. consumed, of 10 cents per kilowatt-hour, and this ranges down to 4 cents for amounts in excess of 1000 kw.-hr. There is a minimum charge of \$1 per month.

Where energy is wholesaled to municipalities or individuals the railway pays the cost of installing the transformers and the meters, and the consumers pay the

cost of the distribution system. Except for the lines east of Columbus, Ohio, a twenty-four-hour service is furnished on all contracts for lighting and power. On some of the railway lines, where a twenty-four-hour service was not originally in effect, special arrangements were made to render service during this period in order to obtain the business. Experience has shown that as a rule the twenty-four-hour service only requires a small machine to take care of the load, and this may be operated economically and without adding materially to the cost of the service. In summing up the business on the lines of the Ohio Electric Railway, it can be said that the lighting load has had the effect of improving the generating-station load factor. This is not true, however, of the power load, which is principally a day load. On the other hand, the lighting and power business has been found to be both desirable and profitable and well worthy of intensive cultivation.

Another of the interurban lines operating in Ohio which sells a proportionately large amount of energy for power and lighting is the Cleveland, Painesville & Eastern Railroad Company. In round figures, 15 per cent of this company's gross income, or about \$75,000 per year, is obtained from power and lighting sales. Its total output averages from 175,000 kw.-hr. to 200,000 kw.-hr. per month, with one customer requiring about 60,000 kw.-hr. This company's consumers include municipalities, private corporations and individuals, and it has adopted the policy of paying for all transformers and meters, and it makes house connections free of charge where they are within 150 ft. of the distribution lines. It has also been the policy to pay for all extensions, providing there is a sufficient amount of business to warrant so doing, but energy is not refused where the consumer provides the distribution system. At the present time the lighting and power load makes up about 20 per cent of the total load carried by the railway company's power station.

A schedule of rates providing for wholesale and retail light and power customers has been filed with the Public Service Commission. Essentially the rate to light consumers is 11 cents per kilowatt-hour, with a discount of 2 cents per kilowatt-hour if paid within ten days after bill is rendered. Power rates range from 5 cents to 1¾ cents per kilowatt-hour with a minimum charge of \$1 per horsepower per month.

New York Association Appointments

J. P. Barnes, president New York Electric Railway Association, has made the following committee appointments for 1915-1916:

Committee on standards: W. G. Gove, chairman; J. S. McWhirter, W. J. Harvie, B. Penoyer, J. P. Ripley.

Committee on military operation: W. C. Fisk, chairman; J. E. Hewes, J. J. Dempsey, George V. Snyder, J. S. Kineon.

Committee on membership: J. E. Hewes, chairman; B. A. Hegeman, H. N. Ransom, J. J. Dempsey, W. H. Collins.

Committee on taxation and rates of fare: W. H. Collins, chairman; C. F. Hewitt, Thomas Penny, J. H. Bennington, J. H. Pardee, R. L. Rand, Ralph Norton.

Committee on compensation insurance: E. A. Maher, Jr., chairman; C. F. Hewitt, C. L. Stone, C. S. Banghart, W. H. Collins.

Committee on public relations: J. K. Choate, chairman; Frank Hedley, E. A. Maher, Jr., E. G. Connette, L. S. Storrs.

Committee on safety rules: B. Penoyer, chairman; F. A. Bagg, C. A. Brooks.

Utility Bonds for Savings Banks

Committee of Investment Bankers' Association at Recent Convention in Cincinnati Suggested Certain Legal Standards for Utility Bonds as Savings Bank Investments—
Co-operation of Utility Managers Asked in Applying Tests to Particular Issues

THE work of the public service corporations committee of the Investment Bankers' Association of America during the last year, as reported to the fifth annual convention of this association in Cincinnati, Ohio, on Oct. 1-4, was largely taken up with the consideration of provisions for a proposed savings bank law covering investment in public utility bonds. In presenting the report Chairman John E. Oldham, of Merrill, Oldham & Company, Boston, Mass., stated that the committee was not making definite recommendations, but rather suggestions, which were subject to further study. If the provisions were acceptable to the association the committee would be glad to have public utilities test their bond issues thereby, and it would then give further consideration to the question, if necessary, so as not to bar out issues that ought to be included among permissible savings bank investments. The main sections of the report, which was approved by the association, and a few points brought out in the discussion thereon, are presented in abstract in the following paragraphs.

In the early deliberations of the committee it became apparent that no single law could be drawn which would be adapted to conditions in all states. It is true that the requirements and purposes of savings banks, wherever located, appear to be much the same, the aim being to invest small savings safely and pay depositors dividends at the rate of 4 per cent annually. In general, the average expense, including taxes, of running savings banks amounts to about three-fourths of 1 per cent of the deposits, and an additional one-eighth to one-fourth of 1 per cent is desired for the purpose of a reserve. To pay dividends of 4 per cent, therefore, requires an average return on investments not far from 5 per cent.

The opportunities for investment in different states, however, vary to such an extent that the methods of obtaining a 5 per cent return also show considerable variation. In some states 50 to 60 per cent of savings bank assets are found to be invested in real estate mortgages and personal loans. As these investments usually yield fairly generous returns, such long-term securities as are purchased can be of a kind to yield a lower income return than would be the case if the yield from the bulk of the investments was not so large. In states of slow industrial growth, however, where few new enterprises are being developed, opportunities to invest in local real estate mortgages and personal loans are often very limited, and it therefore becomes necessary to seek among other forms of investment something which will produce income enough to bring up the

general level and permit a 4 per cent dividend rate for the depositor. Situations of this kind, in the opinion of the committee, apparently provide the most favorable field for the introduction of well-secured public utility bonds to savings bank investment, inasmuch as such bonds are adapted to yield the desired income and furnish the necessary requirements of safety and marketability. The committee undertook, therefore, to make suggestions for situations of the latter kind, leaving a law for the other to be considered at some future date.

SUGGESTED STANDARDS

Gross earnings of at least \$500,000.

Gross earnings equal to four times fixed charges.

Net earnings equal to one and three-quarters times fixed charges.

Investment restricted to utilities in states having commission regulation.

Bonds in general secured by direct lien on operating property.

A REQUEST

"The committee would be glad to have utility managers use its tests on particular bond issues and see how they would qualify. If it finds in actual practice that it is barring out securities that should be eligible, it must see if it cannot word the law so as to include every issue that should legitimately come in."

RELATION OF PROPERTY VALUE AND EARNINGS

In the first place, the committee stated, it will be generally agreed that the face value of the securities proposed to be made eligible for savings bank investment should not exceed the investment value of the property, and that net earnings should exceed the amount of interest charges. While property values and gross and net earnings may appear at first sight to be unrelated, and while, of necessity, there can be no definite and fixed relation which will apply alike in all cases, yet, as both gross and net earnings are so largely determined by rates for service per-

mitted by regulating commissions, and as the investment value of a property is so important a factor in determining rates to be allowed, the committee felt that there is some kind of relationship, and some conclusion as to this relationship must be reached and recognized before undertaking to work out the provisions of a law of this kind. In using the term "investment value of property" the committee had in mind the probable value which will serve as a basis in making rates for service, which, under average conditions, would doubtless be less than the fair market value of the property.

From an examination of a large amount of railroad statistics, public utility appraisals and various rate decisions, it appears that there is little reason to expect a rate basis substantially in excess of an investment of \$5 for \$1 of gross earnings. It is seldom that a value is accepted which exceeds this amount, and more often the relation is \$4.50 to \$1, or \$4 to \$1. The committee believed that a large number of the cases where property investment exceeds five times gross earnings will fall under one of two heads. Either rates are low compared with companies operating in similar circumstances, and the company does not receive the gross earnings to which it is entitled for the amount of investment; or the investment, although made in good faith, fails to realize the results which were anticipated in the way of obtaining business. In the former case, readjustment of rates to a higher level by commissions or

otherwise tends to bring the ratio of earnings and investment to that stated. In the second case, however, if sufficient business does not exist to justify the investment, rates on the business which does exist cannot fairly be raised to a point to yield a return on the entire property even if it were practicable to obtain the business at such rates. As the company will probably be obliged to operate under a scale of rates similar to those of companies whose investment represents only \$4 or \$5 to \$1 of gross earnings, it will be most difficult to obtain a return on the excess of investment, and as the excess investment cannot earn a return and probably will not be recognized for purposes of rate-making, the value of the property to all intents and purposes is reduced to the average level.

CALCULATING THE MARGIN OVER FIXED CHARGES

In cases where commissions have been called upon to determine the rate of return on the investment, they have usually reached conclusions that 6 to 8 per cent was reasonable. If this conclusion is applied to the relationship between gross earnings and investment, as noted above, the amounts necessary to give a 6 to 8 per cent return would require a sum equivalent to between 24 per cent and 40 per cent of the gross earnings. That is, a 6 per cent return on a property value of four times the gross earnings would give 24 per cent of the gross earnings. Eight per cent on five times the amount of gross earnings would give 40 per cent of the gross earnings. It appears from this that from 32 to 40 per cent of gross receipts would be the maximum amount to be expected as an allowance for a return on invested capital where companies are under the supervision of a commission.

From the foregoing, the committee said, it appears that the limit to which money may be loaned upon property must be safely within the amount of four or five times the gross earnings of the property and that the fixed charges must be safely within an amount of from 32 to 40 per cent of the gross earnings. The relationship of the amount of the loan to the property value will be apparent from the amount of bonds, and the relationship to earnings will be apparent from the amount of fixed charges. As the charges bear a fixed relation to the amount of bonds, they may be taken as the starting point in the establishment of standards for such purposes as the proposed law. They may be measured in their relation to net earnings representing a basis of earning power, or in their relation to gross earnings to show indirectly the relationship of bonds to the value of property.

If a sufficient margin of net earnings over interest charges were the only requirement, the committee observed, it might occur that this margin was obtained as the result of abnormally high rates for service, abnormally low wages or power costs, or insufficient maintenance of the property. In these cases the net earnings might be obtained from gross earnings on a smaller investment than would warrant the amount of bonds indicated by fixed charges. If investigation were made by a commission, net earnings might be allowed only on such investment, which would not give enough of a margin over fixed charges. Or the advantage from low operating costs might disappear as conditions changed, and the margin be dangerously reduced from this cause.

Large net earnings resulting from a low operating ratio were said to indicate either more than an average investment on which the usual return is allowed, or an abnormal rate of return on what is recognized as an average investment. An abnormal return on invested capital would not be likely to continue indefinitely but would result in agitation for lower rates for service,

which, if brought about, would be followed by a decrease of both gross and net earnings. The final result would then be to establish a relation of earnings to property investment such as is found under average conditions. On the other hand, if the relationship of fixed charges to gross earnings, as showing the relation of bonds to property value, should be taken alone, a generous margin of value over bonds might exist, but the property might be burdened with heavy expenses which would leave net earnings entirely insufficient to provide a safe margin over charges.

BOTH GROSS AND NET EARNINGS MUST BE CONSIDERED

After consideration and experimenting, the committee decided that net earnings equal to one and three-quarters times fixed charges offer a fair margin of safety and that gross earnings equal to four times fixed charges offer sufficient evidence of a property value in fair proportion to the amount of bonds.

It is necessary, however, to combine these requirements as a check upon each other. For instance, in the case of a property with \$100,000 of gross earnings the value might be \$500,000. If it were bonded for this entire amount, the fixed charges would be \$25,000, and the requirement that gross earnings should be four times the fixed charges, would be met. To show one and three-quarters times these charges, however, would require \$43,750 of net earnings applicable to a return on capital and allowance for depreciation. This is not an uncommon proportion of net earnings to gross; and yet if the company were involved in a rate case before a commission, it would probably not be allowed in excess of 6 to 8 per cent return on \$500,000 investment, or only from \$30,000 to \$40,000, which would not provide a sufficient margin over the \$25,000 fixed charges to comply with the requirement.

On the other hand, the committee cited the case of a company with \$100,000 of gross earnings operated for 44 per cent and having \$56,000 of net earnings. This, at a ratio of one and three-quarters to one, would justify \$32,000 of fixed charges, equal to 5 per cent on \$640,000 value, an amount probably in excess of any property value which the commission would find. Gross earnings, however, would not be four times the charges; consequently, such bonds could not qualify.

While situations may exist, because of special circumstances, where a return may be allowed on more than average investment value, or the rate of return allowed may be above the average, at the same time the committee believed that in drafting a law of this kind it should have in mind average and not special conditions. The restrictions suggested would guard against investments based on excessive property values unaccompanied by necessary earning power both gross and net. The provisions for gross earnings would be a protection against larger net earnings than could probably be maintained, and the margin between net earnings and fixed charges would provide against decrease in net earnings due either to falling off of business, reduction in rates, increase in cost of operation or other unforeseen causes.

KINDS OF UTILITIES TO BE ELIGIBLE

In regard to the kinds of utilities which afford a suitable field for savings bank investment, the committee felt that it is advisable, for the present at least, to include only companies furnishing artificial gas, electric light and power, local transportation and telephone and telegraph service. It was suggested that the recent development of the jitney and other independent

systems for local transportation makes it desirable to specify in the law that local transportation companies must operate cars running on tracks. Furthermore, it was not deemed sufficient for the purpose of savings bank investment that the corporations whose securities are made eligible should be engaged in the kinds of business above designated—they must be engaged in them in a really public way. The earning power needs to have the stability afforded by an income derived from the general distribution of service. A power company selling its entire product to a few large manufacturing concerns would not come within the requirements of the law as proposed.

The committee, after some study of various utility properties and the market for their securities, suggested that companies must have at least \$500,000 of gross earnings in order that their securities may qualify for investment. It was believed that this figure fairly marks the point where the advantages of a well established market for the securities of a corporation may be expected to exist. The committee also suggested, in order that there may be assurance that earnings are derived from a general distribution of service, that if 10 per cent or more of the gross earnings is derived from any one customer, the revenue from that customer shall be excluded in determining the size of the corporation. It is not the intent, however, to exclude these earnings in the other provisions of the law. The committee proposed that investment should be limited to companies located within the United States, and it believed that investment can to advantage be further limited to those states which have public utility commissions with powers of protection of utilities and their investments.

The committee was of the opinion that it would be unwise to try to draft definite provisions in regard to franchises. To require that all franchises should extend beyond the life of the bond would disqualify some of the best securities, and possibly place in a doubtful position corporations operating in states providing for the so-called indeterminate franchise. To require that the principal franchise should extend beyond the life of the bond would raise the difficult question as to what the principal franchise of a particular corporation is. The committee believed, therefore, that in limiting investment to the securities of corporations operating in those states which have public service commissions with jurisdiction over rates and requiring a certificate of public convenience and necessity, it had done as much as is practicable in the form of a general rule in safeguarding investment against franchise difficulties.

DEFINING FINANCIAL TERMS

It appeared best to the committee to adopt a principle which would limit the proposed investments to the securities of operating companies except as further noted, and only to those securities which possessed a direct lien on property operated in the service of the public. This would insure that the earnings on which the restrictions were based should come directly from the operation of a utility, rather than in the form of interest or dividends, and that in case of trouble the security holders could at once take possession of the operating property.

This led to the proposed definition of gross earnings as income received from properties owned and operated, or leased and operated (intercompany items excluded). In some cases the earnings of properties controlled (by stock ownership) and operated, might be so merged in a company's statement of gross earnings as to make their inclusion necessary, and it is possible that some provision should be made for situations of this kind.

This, however, is open to the objection that securities issued by a company which merely controls its subsidiaries, usually can give a lien only upon their securities and not upon the properties, and therefore do not meet the requirement calling for a lien upon actual property used in operation. It is possible, however, that it may be advisable to make provision for companies owning the entire amount of securities of operating companies and pledging the same as security for bond issues in such a way that in event of foreclosure the property could be reached as effectively as if secured by direct mortgage.

With regard to net earnings, these were defined by the committee as "the amount remaining after deducting from gross earnings the amount of operating expenses (including therein expenses of reasonable and proper repairs, current renewals and maintenance, license charges, taxes and insurance) for all properties, the income from which is included in gross earnings." The committee said that it might be open to discussion what should be the exact wording of this definition, particularly with regard to maintenance and possible provision against depreciation. Moreover, it believed that there might properly be added to this definition a provision for the inclusion of income from outside sources, such as securities owned. An objection to this would be that bonds could be issued on the basis of net earnings which might come from other than public utility operation, but the required ratio between gross earnings from operation and fixed charges would act as a check to prevent a company from taking advantage of this provision except to a small extent.

Fixed charges in a general way were said to include all interest paid upon the direct and assumed obligations of a company and all rentals paid, whether in the form of cash payments or dividends or interest on securities of leased properties. These charges, however, include such payments only when made outside the company and do not include interest or dividends on securities held by the company itself.

SECURITIES THAT WOULD QUALIFY

The committee suggested, as before stated, that in selecting the securities of companies which qualify for investment, the principle should be followed of allowing only bonds which are secured by a direct lien on operating property from which the company's gross earnings are derived, and are the direct or assumed obligations of the company which qualifies or are bonds of leased and operated properties guaranteed as to both principal and interest by indorsement by such a company. This limits investment to mortgage bonds except that the committee believed that an exception may safely be made in the case of a bond issue secured by entire issues of first mortgage bonds of operating properties whose gross earnings are included in a company's statement of gross earnings, as such an issue would give in effect a first lien on operating property.

With the above exception the eligible classes of bonds recommended by the committee would be either first mortgage bonds, refunding mortgage bonds or bonds underlying a refunding mortgage. No minimum amount was thought necessary as to the size of a bond issue to qualify under the law. First mortgage bonds would have the requirement of having been secured on all the property of the issuing company at the time of issue (though not necessarily secured by a first mortgage), and of being secured by a first mortgage on this property at the time of investment (though not necessarily on the entire property of the company at that time). Refunding mortgage bonds would be secured by a mortgage on all the property of the company at the

time of issue, would provide for the payment at maturity and retirement of all underlying bonds and would mature at a later date than any of such underlying bonds. It was also thought best to require that the amount of additional bonds issued under the refunding mortgage shall be at least equal to the amount of underlying bonds. The inclusion of refunding mortgage bonds makes it logical to include also the bonds underlying such refunding mortgage. Some of these may already qualify as first mortgage bonds, and as those which do not are acknowledged by the company creating the refunding mortgage as prior obligations and are to be replaced by bonds qualifying as legal, it seems reasonable to include them as eligible.

In addition to the bonds already considered, the committee discussed the senior bond issues of companies whose junior issues would not qualify. It suggested the inclusion of first mortgage bonds of such companies which conform in their fixed charges (interest on first mortgage bonds plus rentals of the company) to ratios of 1 to 5 and 1 to 2 with the gross and net earnings respectively. The committee also recommended the inclusion of refunding bonds on similar terms for companies not complying with the credit requirements.

MISCELLANEOUS REQUIREMENTS

The committee suggested that where for the purposes of the law a certain ratio of earnings to fixed charges is required, this ratio must have existed in the three fiscal years of the company next preceding investment. The requirement as to amount of gross earnings, however, need have existed only in the fiscal year next preceding investment.

It was believed that a provision should be included similar to that in some existing savings bank investment laws, permitting a company's securities to remain legal although the company fails in one fiscal year to maintain its standard of general credit. This should follow the existing laws, however, in not allowing further investment in such a company's securities until the company has again attained the required standard, and in not allowing the term of probation to extend more than one year.

It was proposed by the committee that, at the request of any bank, the bank commissioner shall give his opinion as to whether a bond satisfies the requirements of the act. He may accept as evidence the regular annual financial statement, including the income account and balance sheet of the corporation, verified by the affidavit of the president or vice-president or treasurer. The bank commissioner, however, may require such further evidence as he may desire. He shall publish each year a list of the bonds approved. Unless notified by the commission to the contrary, a savings bank may consider any bond appearing on the list as an investment which it is authorized to make until a new list is published in which the bond does not appear. Unless the corporation, whose bonds have been approved by the bank commissioner as a legal investment, shall within three months after the close of its fiscal year furnish to the bank commissioner evidence of the regular annual financial statement, the bank commissioner may notify any savings bank, or all savings banks, that they are not authorized to make further investments in such bonds until contrary notice is given by their inclusion in the printed list or otherwise.

DISCUSSION ON THE REPORT

In reply to a question whether or not the field might be so narrowed as to have eligible securities quoted at a premium with less than a 5 per cent yield, Mr. Oldham stated that in the committee's opinion the forego-

ing restrictions represent the minimum ones which banks can use and be safe, whether they narrow the field or not. As regards the companies that will qualify, it has been absolutely impossible to obtain at the present time from public sources information which will satisfactorily test the provisions. The thought of the committee was that if it could come to some conclusions as to what were desirable provisions and restrictions, then it would get into touch with the public utility managers and hear what they have to propose. The committee stated that it would be glad to have them use this test on the bonds of their corporations and see how many of them will qualify and what provision it is that bars them out. If it finds in actual practice that it is barring out securities that ought to come in, it must see if it cannot word the law so as to include everything that can legitimately come in. Mr. Oldham said that the committee cannot make the test of every situation on the basis of information which is to-day available. Reports are made in all kinds of form and the information is very incomplete. In his opinion, the statements of public utilities, if the utility bonds are going to take their proper place in the market, should show greater uniformity.

In regard to depreciation Mr. Oldham stated that the ratio of $1\frac{3}{4}$ to 1 for net earnings to fixed charges would allow sufficient margin to cover that item. If companies were starting afresh, depreciation should be included in operating expenses, in which case the ratio of net earnings to fixed charges might be only $1\frac{1}{2}$ to 1. Practices in accounting for depreciation differed, but the committee felt that it was willing to stand for the $1\frac{3}{4}$ to 1 ratio, which would provide enough to take care of the decreased earnings and proper charges for depreciation.

Demand Charges and Purchased Power

In a paper on "Demand and Load-Factor Systems," presented by R. S. Hale, of the Boston Edison Company, at the recent convention of the New England Section of the National Electric Light Association in Pittsfield, Mass., reference was made to the purchase of power by street railways. The author compared a number of different systems of demand measurement and charge bases, pointing out that for a street railway, and especially for one of small size, the difference in charge between a five-minute and a thirty-minute demand would be large; probably 20 or 30 per cent, if not more. A small street railway with about the same business each month would have the highest demand on a system of demand measurement in which the highest five-minute peak is taken each month by itself, so far as eleven schedules compared in the paper were concerned. Such a road would have the next highest demand on a schedule taking the single highest fifteen-minute peak in the preceding twelve months. The next highest peak would be obtained on a system of charging based on the highest half-hour peak occurring since the last annual readjustment of demand by the central station organization. The next would be on a system averaging the four highest half-hour peaks, one on each of four different days in any one month, taking the highest month of the previous twelve months. The next highest demand for such a road would be obtained on a system averaging the 150 highest half-hour peaks (whether on the same day or on different days) in the whole previous twelve months, or a pro-rata number if the road has been connected less than a year. There would be perhaps 50 per cent difference between the first and last of the foregoing outlined methods.

Fifth National Safety Congress

Street and Other Accident Reduction, Vehicular Traffic Regulation, the National Electrical Safety Code and Power Plant Hazards Were Among Topics Discussed at the Congress Last Week

THE fifth annual national safety congress, under the auspices of the National Safety Council, was held at the Hotel Statler, Detroit, Mich., from Oct. 17 to 20 inclusive. It was attended by about 1200 representatives of manufacturing industries, railroads and public service companies. The meetings were largely of a sectional character. The electric railway section meetings were attended by about sixty men, and nine papers were read and discussed at two meetings held on Thursday. Some of the discussion before the public utilities and public safety sections was also of interest to the electric railway men. An abstract of some of this material follows:

Electric Railway Section

THURSDAY MORNING SESSION

In opening the sectional meeting Chairman G. O. Smith, Doherty Operating Company, New York, explained that since the section was formed one year ago the activities had been confined to the membership campaign and the inauguration of the bulletin service. He then called for committee reports.

H. A. Bullock, Brooklyn Rapid Transit System, reported for the membership committee that eighty-nine electric railways are now enrolled, as compared with thirty-four a year ago. He stated that very pleasant relations have been established with the American Electric Railway Association and that arrangements are being made for reciprocal relations with the Safety Federation of America and the American Museum of Safety. He moved a vote of thanks, which was passed, to James H. McGraw and his associates on the ELECTRIC RAILWAY JOURNAL for their co-operation in this campaign. He also distributed copies of a catalog of lantern slides on safety topics, prepared originally for the Brooklyn Rapid Transit Company. Arrangements have been made by which these slides can be procured at a nominal price through the National Safety Council, Chicago, Ill.

After an informal report by Secretary C. B. Scott, Bureau of Safety, Chicago, Ill., the report of the committee on standards was read. This committee approved the use of near-side stops where possible and also the joint report on protection at grade crossings prepared by representatives of the American Railway Association and the National Association of Railroad Commissioners. However, as the American Electric Railway Association and the National Safety Council did not participate in this report it was recommended that a committee on the subject be appointed to work in conjunction with the American Railway Association and the American Electric Railway Association. The committee also indorsed the recommendations of the Massachusetts Highway Commission relating to increasing safety at the sites of eliminated grade crossings.

The standards committee also submitted an outline of the practice of one company in educating employees, and a list of car equipment features affecting safety.

Among other things it recommended that no men on the extra list be appointed to safety committees and that members of such committees be paid for the time put upon this work. Instruction schools, with sample equipment where practicable, were recommended for all companies which can maintain them.

For the committee on bulletin service Chairman Smith reported that special electric railway bulletins had been furnished during the year, although it had proved difficult to get this work started. Co-operation is needed, but ample material can be obtained.

RELATIONS WITH EMPLOYEES AND THE PUBLIC

Two papers on this general subject were presented by J. L. Roche, Pittsburgh Railways, and H. H. Norris, ELECTRIC RAILWAY JOURNAL. C. G. Rice, Pittsburgh Railways, was scheduled to speak on "How the Attitude of the Public Toward the Railroad Company Is Influenced By Systematic Safety Work." He was not able to be present and Mr. Roche spoke in his place from Mr. Rice's notes.

Mr. Roche said that progressive corporations to-day have adopted a policy of fairness and frankness. The Pittsburgh Railways have a number of fundamental principles which serve as a guide to employees. These are illustrated in the code of ethics and policies outlined in the issue of this paper for Sept. 7, 1916, page 712. He said further that all accidents are due to human or material failure. The first results from incapacity, negligence due to lack of understanding or to monotony of task, etc., and willful negligence. The remedies were stated to be as follows:

Incapacity can be eliminated by careful selection of men and proper training and inspection thereafter. Negligence, other than willful, can be corrected by instruction, mental examination, inspection, discipline, welfare work and physical examination. Willful negligence can only be eliminated by discharge.

Coming to the public phase Mr. Roche said that there are three classes of chance takers: (1) Those who realize the danger and deliberately take the chance; (2) those who realize the danger but act thoughtlessly, and (3) those who do not realize the danger. In reducing the number of chance takers, explanation and seeking of co-operation are the factors. He then explained what the Pittsburgh Railways have done to control accidents, with the understanding that safety work must be sincere, systematic and persistent. This included an exhibit throughout the winter at a local exposition, the distribution of the "Pla-Safe" game invented by one of the company's men, the circulation of safety coins, etc., in other words, continually impressing the slogan "Safety Always."

Mr. Roche confessed that in spite of this work accidents have increased, but it has held down the rate of increase. He believed that a large part of accidents are preventable, that carelessness should be made a criminal offense, that safety rules should be standardized and that the means employed in safety work are incidental as compared with the object in view.

Mr. Norris next read his paper on "How the Safety Movement Is Helping the Electric Railway Solve Its Problems." He explained first that the purpose of the

paper was to draw, from a survey of the recent safety work of a number of typical railways, a few conclusions as to what is being definitely accomplished, with a view to justifying a reasonable and continuous expenditure of funds in this direction.

Eliminating from consideration all railway problems very remotely concerned he divided the remainder in two ways:

First, those in which money considerations are involved, and others in which the financial aspects are secondary.

Second, those which bear on the relations of a company with the public, and those in which only employees are concerned.

He said that the most critical problem in the electric railway to-day is how, while maintaining good service, to preserve a reasonable net return on investment in spite of increased service requirements on one hand and decreased income, as measured by purchasing power, on the other. Next in importance is the preservation and cultivation of good will on the part of the public, so that reasonable operating conditions may be assured and the confidence of investors maintained. A third problem is the cultivation of such relations with employees that loyalty and co-operation may be fostered for the purpose of aiding in the solution of the other two. He then raised the queries:

(1) Does systematic safety work pay in dollars and cents; (2) does it pay in fostering public good will, and (3) does it conduce to loyalty on the part of employees?

Mr. Norris then proceeded to answer these questions by means of examples drawn from the experience of many companies and introduced quotations from letters from leading railway men. His conclusions were as follows:

1. The safety movement is contributing to the solution of the most difficult problems before the electric railway to-day.

2. The contribution is more important in the way of providing means for the public, the employee and the company officials to meet upon a platform of common interest than in direct money saving.

3. The movement among electric railways is gaining momentum rapidly, but after this momentum has been acquired a sustained effort will be needed to maintain it.

Mr. Bullock opened the discussion on the papers by Messrs. Rice and Norris by stating that as papers like these accumulate in the reports of the section meetings they will furnish valuable material for safety campaigns. He firmly believed that applying the principles of safety will overcome prejudice and promote friendly public relations. J. H. Harvey, Kansas City Railways, agreed that when the keynote of the work is good will, pleasant relations with public and employee will result.

In reply to a question suggested by Mr. Norris's paper Mr. Smith explained that certain committees of trainmen sent out by the Toledo Railways & Light Company to inspect safety work on other properties had presented interesting reports, copies of which could probably be furnished if desired. Other speakers dwelt upon the factor of the problem introduced by the difficulty of getting and holding good men due to abnormal industrial conditions.

AUTOMOBILE HAZARDS

The next paper read by the author, W. W. Lowe, Toledo Railways & Light Company, was entitled "Preventing Accidents Between Street Cars and Automobiles." He first pointed out that automobiles have both reduced revenues and increased accidents. In endeavoring to reduce the latter he believed that humanitarianism should be the basis of effort. He then quoted statistics

from H. G. Winsor's Atlantic City convention paper on this subject, showing the tremendous increase in numbers of automobiles registered and of collisions. It was estimated that 5,000,000 cars would be in use in this country in 1920. Mr. Lowe said that in Toledo 78 per cent of the accidents occur outside of the congested district, the peak occurring when people are returning from work.

Taking up remedial measures Mr. Lowe divided them between education and restriction. The latter plan is successful abroad. He mentioned the following measures: (1) Systematic education of railway employees; (2) following up their training; (3) education of automobile drivers as to the results of carelessness; (4) restrictions as to the issuing of chauffeurs' licenses; (5) traffic regulations, and (6) enforcement of the last-named.

He thought this subject important enough for special consideration by a committee.

The discussion on Mr. Lowe's paper was opened by W. E. Cann, Detroit United Railway, who referred to the appalling recent increase in collisions with vehicles in Detroit. This is an automobile city, and there is much reckless driving. The effort to educate drivers has not been successful. He advocated the locking up of law-breakers' machines and said that electric railways must get behind law enforcement. On motion of Mr. Scott the section then approved Mr. Lowe's suggestions and requested the Council to carry them out.

F. E. Rankin, Detroit United Railway, said that good drivers caused as many collisions as green ones. Another speaker considered most traffic ordinances too complex, as even the traffic officers do not always understand them. He thought that the proposed committee should attempt to standardize these ordinances. His company trains its chauffeurs just like motormen, and he said that drivers among the public should be similarly trained.

In response to a question as to the offsetting of increases in automobile collisions through reductions in other types Mr. Lowe said that the totals have increased. H. B. Adams, Aurora, Elgin & Chicago Railroad, Aurora, Ill., then described a letter campaign conducted in conjunction with automobile clubs, which he said had produced a good response. Mr. Cann also described a recent check made at a crossing to determine the effect of the warning bell. Seventy per cent of the drivers paid no attention to the bell and 30 per cent crossed while the bell was ringing.

Dr. F. D. Patterson, Pennsylvania Division of Labor and Industry, Harrisburg, Pa., said that there should be a law requiring a driver to carry a card with his photograph upon it, and on the back of this card his court record could be entered. While agreeing that this would be good S. H. Reid, Middle West Utilities Company, Chicago, Ill., thought it could not be introduced soon. Referring to a motorman in Philadelphia who did not have an accident in forty-five years and to other cases of men who do not have accidents, he said that education of motormen will bring good results. On the other hand, J. C. Rose, chief claim agent Pennsylvania Railroad, said that the burden is on the vehicle driver. In answer to a question as to the prosecution of automobile drivers, Dr. Patterson said that it is the custom of the Long Island Railroad to prosecute those who cause damage. The railroad sues for the amount of the damage and sometimes collects it. In response to another question F. W. Fisher, Rochester (N. Y.) Railway & Light Company, said that at a crossing near Rochester automobiles are required to stop before crossing a high-speed interurban line.

The last paper on Thursday morning was by H. W. Clapp, Columbus Railway, Power & Light Company,

Columbus, Ohio, on "How Graphic Charts and Bulletins Help in Safety Education." He began with the statement: "Charts are the text-book of safety" and explained that in his company systematic educational work was undertaken because the spasmodic work was seen not to have been successful. He said that cartoons had proved efficacious in interesting indifferent bulletin board readers. In the bulletins this company uses graphics freely and feels that the boards are responsible for much of the interest in safety.

Mr. Clapp exhibited some sample charts in which the records of collisions with automobiles and related data were clearly shown. The cartoons were in blue print form. The result of the work has been to keep down the rate of increase in these accidents as compared with other cities. The result would have been better but for the large number of new men employed, as new men cause accidents. At present a safety contest is on. At its close \$1,000 will be distributed so that men in the winning carhouse will receive two days' pay each and those in the second carhouse one day's pay.

In the discussion of this paper Mr. Bullock said that Mr. Clapp's plan for comparing data of successive years requires reasonably stable conditions in the districts served by the different carhouses, otherwise inequalities could creep in. In Brooklyn, for example, the population shifts radically at times. To this Mr. Clapp agreed, stating that in Columbus there are no violent changes in population. Furthermore on account of the low fare, averaging 2.65 cents gross, the extension requirements are reasonable. Under the present franchise the population is not being spread out much. Conditions are ideal for the present contest.

NEW OFFICERS OF THE SECTION

Before closing the Thursday morning session the following elections for the ensuing year occurred: Chairman, H. A. Bullock, Brooklyn Rapid Transit System; vice-chairman, E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa.; secretary, J. H. Harvey, Kansas City Railways; chairmen of committees—membership, George Oliver Smith, Doherty Operating Company, New York; standards, C. G. Rice, Pittsburgh Railways; safe practices, H. W. Clapp, Columbus (Ohio) Railway, Power & Light Company; program, H. G. Winsor, Puget Sound Electric Railway, Tacoma, Wash.

Electric Railway Section

THURSDAY AFTERNOON SESSION

The first paper at the second session was by J. H. Harvey, Kansas City Railways, on "Safety and Efficiency," in which he described the recent campaign inaugurated by his company. The situation in Kansas City regarding the former attitude of the public was described in the issue of the *ELECTRIC RAILWAY JOURNAL* for Sept. 30, page 667. Before beginning its campaign the company sent a representative to other cities to study the results of campaigns, and membership in the National Safety Council was taken out.

Mr. Harvey explained that the safety organization provided comprised the following: A general safety committee consisting of representatives of the claim and legal department, the publicity agent and the superintendent of efficiency; a supervisor of safety directly under the foregoing; a central safety committee consisting of the heads of nine departments, and departmental and local committees. The work was organized to reach the schools, vehicle drivers and owners,

the general public and the employees. The details of the several divisions of the work were then discussed by the speaker, indicating that the campaign is being conducted along modern lines.

The discussion was opened by C. C. Johnson, Virginia Railway & Power Company, Richmond, Va., who explained the plan for the coming safety-first week in that city. This will begin on Nov. 6 and will be conducted in connection with the Boy Scouts and with the cooperation of the police department. Mr. Scott agreed with Mr. Harvey in the contention that safety work with employees is most important. He expressed belief in an organization which makes trainmen an important part of the safety work, and in the importance of holding meetings with them if possible every thirty days.

THE NATIONAL ELECTRICAL SAFETY CODE

The second paper was by W. J. Canada, United States Bureau of Standards, Washington, D. C., on "The Application of the National Electrical Safety Code to Electric Railway Construction and Operation." He first traced briefly the history of the code and said that the American Electric Railway Association and the National Safety Council began very early the constructive criticism of the code, and the assistance which these associations thus gave has been very helpful.

There are still, however, certain apprehensions remaining in the minds of some of those least thoroughly acquainted with the safety code as to the effect that even the trial adoption and use of the code will have on the electrical industry. These apprehensions have, in general, been growing less as the acquaintance with the code has become closer through careful study of its provisions.

Commissions in general are approaching the introduction of the code with full appreciation of the difficulties involved in applying a definite standard to a kind of construction and operating practice in many ways as yet not standardized. They express the intent to make their administration moderate and reasonable and the feeling that standardization in closer detail will be feasible and desirable at a later date than is practicable at the present time.

Referring next particularly to the electric railways Mr. Canada said that the principal life hazards of electric railways are traffic hazards, but the electric life hazards, while less, are still unnecessarily great, since many of them are known to be avoidable through feasible precautions, such as the safety code presents. Most, even of the electrical safety problems of electric railways, are common to all branches of the electrical industry. For example, the electrical utilization hazards in railway carhouses and in the electrical car equipment handled by the motormen are, except in detail, the same as those of electrically equipped factories where the electrical equipment is incidental to the other processes carried on and requiring attention of the workers.

In outlining those code rules which refer especially to electric railway conditions, Mr. Canada said that all transmission lines, underground distribution and overhead feeders are classified in the code with electrical supply lines of the same voltage and general character and are required to comply with all the rules for strength of their construction in the same way as such supply lines. Where practicable, overhead lines of various users should be arranged by mutual agreement of the utilities concerned at standardized levels throughout a given community in order to minimize difficulties and dangers when new crossings or extensions to existing lines are to be installed. Parallel pole lines, where practicable, should be so separated from each other as

not to conflict; but if this is not practicable, a common pole line is preferable to two conflicting lines, unless the high voltage of certain circuits or the large number of conductors make the use of a single pole line undesirable or impracticable.

The speaker then took up in considerable technical detail the special rules governing the construction of the electric railway itself. For example, third-rails are required to be protected, where not on fenced rights-of-way, by suitable overlapping guards. Third-rails may well be protected even on fenced rights-of-way where the presence of employees is often necessary. Trolley contact conductors under 750 volts are to be maintained at sufficient tension and with supports sufficiently close together so that the breaking or loosening of a single conductor fastening will not allow the trolley conductor at any point to come within 10 ft. from the ground, etc.

On the subject of "Operating Precautions for Electrical Workmen and for Trainmen," he said that the precautions which can be expected of motormen or conductors in the handling of electrical equipment on cars are very limited, and no rules for them have been included in the code. When some adjustment has to be made under the car or on top of the car or within the car, and not directly affecting car movement, it is presumed that the general instructions to trainmen will call for removal of current collectors from trolley contact conductor or third-rail before proceeding. Adjustments on top of cars are always dangerous because of proximity to live trolley wire. For adjustments concerned with ordinary operation of the car, or necessary in emergencies while car is running, no precautions against electrical shock or burn should be demanded of the trainmen. His undivided attention is demanded for his handling of his car's movement in such a way as best to protect passengers and exterior traffic. The line and car construction requirements of the safety code outlined in the code will assure the trainmen of reasonable immunity from electrical dangers during ordinary car operation, and by protecting him will also safeguard his passengers.

A brief discussion followed the presentation of the above paper relating principally to technical details of grounding transmission lines and cables for the protection of workmen.

POWER HOUSE HAZARDS

F. W. Fisher, Rochester (N. Y.) Railway & Light Company, next read a paper on "Hazards in Power Houses and Their Remedies." He divided the former into two classes—construction and operation. The former, he said, were thoroughly covered in the paper by Mr. Penrose, abstracted on the next page. In operation there are those hazards which are common to all industries and those inherent to power house operation. Of power house accidents, from the experience of his company, he had found that 16 per cent were non-electrical burns, 16 per cent were electrical burns, 15 per cent were due to falls, etc., 13 per cent to falling materials and the remainder to sundry causes. Of this class of accidents 38 per cent were inherent to power house work. Some were due to faulty design, others to faulty operation of machinery.

Mr. Fisher felt that new power plants are being built with due regard to safety considerations, and he had in mind in his paper particularly those of the older type. He put in a plea for a careful safety study of individual properties, particularly of those which had been built for some time.

W. F. M. Werth, Detroit United Railway, opened the discussion by referring to the special hazards of the

boiler room which he thought should have more attention. The men in the boiler room are apt to become slack and to incur unnecessary risks. He raised a question as to Mr. Fisher's recommendation that switchboards should be isolated from the engine room on account of safety. Mr. Fisher said that in some cases this is desirable to protect them from escaping steam.

Mr. Scott said that he considered the percentage of accidents of an inherent power house nature, as reported by Mr. Fisher, to be quite high. In an analysis made by himself only 8 per cent of 6000 accidents were due to electric current. However these represented 70 per cent of the money cost of the accidents, and 71 per cent of the fatalities and of the time lost over thirty days. In response to a question as to what he termed an accident Mr. Fisher replied that in his data anything reported to a foreman was so considered.

CAR EQUIPMENT AND SAFETY

The next paper was one by C. H. Cross, Milwaukee (Wis.) Electric Railway & Light Company, on "Safety Devices on Electric Street and Interurban Cars." These he divided into two classes, audible devices and visible devices. He first showed that inclosing the motorman's platform to protect him makes it more difficult for the motorman to operate his car safely.

Mr. Cross then took up systematically all of the devices on the car which affect safety of operation. In so doing he mentioned the present tendencies in each case and commented upon the efficacy of the several devices. He also recommended the standardization of signal operating parts in the interest of safety.

The list of devices covered by the speaker included brakes, buffers, controller locks, circuit breaker, grounding connections, prepayment equipment, safety gates, door signals, fenders, fire extinguishers, headlights, safety signs, sanders, safety treads, tail lights, window guards, etc.

Under the head "platform safety" he discussed briefly the organization and discipline necessary in making the above-mentioned devices effective.

PHYSICAL EXAMINATION AND SAFETY

At this point Dr. C. M. Harper, surgeon Toledo Railways & Light Company, was called upon and responded with some cautions regarding physical examination of employees. He said that many of these are farces and that a thorough examination requires at least two hours. Team work among physicians is necessary so that the services of specialists in several lines may be utilized. This costs money, but it is a good investment. Companies cannot expect good work if they pay for it in passes only.

INSTRUCTION OF MOTORMEN

The last of the electric railway papers was by H. B. Adams, Aurora, Elgin & Chicago Railroad, Wheaton, Ill., on "Methods of Instructing New Motormen in Their Duties." It was a description of the method used on a modern property where the instruction is not done in a school, but is given by the motormen, the shop foremen, the service inspector and the safety supervisor. The applicant serves for a time with a motorman on each of the city and interurban lines and the third-rail line, is shown the equipment in the shop and is subjected to numerous examinations.

In response to a question Mr. Adams said that the motormen are all re-examined every six months.

CLOSE OF ELECTRIC RAILWAY SESSION

In bringing the electric railway meetings to a close Mr. Bullock took the chair and announced the plan for the coming year. He said that first the effort will be

to expand the membership and to cement the friendly relation with the American Electric Railway Association. Next the special bulletin service will be developed and made more responsive to the needs of the members. In co-operation with the United States Bureau of Education the school safety work will be pushed. Finally it is hoped that the committee on standards may get up a set of safety organization plans adapted to the several requirements of typical classes of roads.

Notes on Other Section Meetings

In addition to the special electric railway section meetings several papers at other section meetings related more or less closely to the electric railway field. This is true particularly of the public safety and public utilities sectional meetings.

PUBLIC SAFETY WORK OF PUBLIC SERVICE COMPANIES

Under the above title, at the public safety meeting held on Friday, H. A. Bullock, Brooklyn Rapid Transit System, traced the relation of public safety and public relations, stating first that public street hazards are the largest element of electric railway hazards. In this work a friendly atmosphere must first be produced and then the proper mental attitude of the public must be created.

The public attitude is made up of a number of elements: prejudice, indifference, objection to interference with personal liberty, political interference and natural carelessness and recklessness. These points Mr. Bullock took up in order somewhat as follows: First, prejudice must be overcome by the railway "cleaning house" itself and furnishing service with a degree of safety compatible with the conditions of operation of an inherently dangerous business. Then the facts must be duly advertised.

To overcome indifference statistics and details of accidents must be given out. People will be reasonable also if they realize that safety comes about through self-imposed restraint, and this they can be made to do through suitable advertising. As to political interference, the best plan is to leave office holders alone, as they will be glad to take hold after the work has been started. Finally, on the matter of recklessness it should be remembered that long protection of the individual by society has caused him to relax his vigilance. He needs further protection from his own sense of security. Patience and experiment are needed at this point, and the schools and the newspapers will be the potent factors in this work.

LOCAL ORGANIZATIONS FOR SAFETY ACTIVITIES

At the public safety meeting another speaker was R. W. Campbell, Illinois Steel Company, Chicago, Ill., who also presided in the absence of Chairman E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa.

Mr. Campbell outlined the ideal safety organization in a community under the direction of a local branch of the National Safety Council. His plan comprehended the co-ordination of all local activities under appropriate committees. His complete plan is available in pamphlet form.

STREET TRAFFIC REGULATION

Still another topic relating to public safety was that of street traffic regulation, as presented by William P.

Eno, traffic expert. Mr. Eno presented an abstract of a pamphlet on this subject which has also been issued by the Council.

POWER STATION SAFEGUARDING

Reference was made earlier in this report to a paper by Charles Penrose, Philadelphia Electric Company, on means for preventing accidents in power plants. In connection with this paper Mr. Penrose showed a number of lantern slides from drawings and views of one of the newer plants of his company. He divided his topic into erection safeguards, permanent safeguards and the relation of the employee to station safeguarding. The paper was so exhaustive that only a brief abstract is possible here. However, the following points are typical of the line of treatment.

During construction, electrical equipment should be largely used, and it should be installed with care, especially wiring and transformers. The architect's specifications should be so drawn that suitable safety clauses are provided. During construction there should be full co-operation with the local inspection bureau. As the work proceeds the clean-up gang should do its work properly to eliminate risks caused by rubbish. It might be well for the utility to employ a safety inspector to study accident hazard continually.

Assuming the building itself to be well constructed there next comes the layout of the equipment to eliminate risk. The modern plant is simple in construction and is provided with oil switches and reactors as protection. The high-tension apparatus is isolated and suitable indicating devices show the condition of switches. Duplicate bus bars are provided for emergency use. Stairways are used in place of ladders, pipe lines are plainly designated by distinctive painting, and foolproof signal systems, etc., are used.

Finally every possible device is used to encourage the employee to protect himself.

ELECTRIC RAILWAYS REPRESENTED

The following is a list of the electric railway companies represented at the meeting:

- Aurora, Elgin & Chicago Railroad, Aurora, Ill.
- Boston (Mass.) Elevated Railway.
- Brooklyn (N. Y.) Rapid Transit Company.
- Columbus (Ohio) Railway, Power & Light Company.
- Columbus (Ga.) Railroad.
- Connecticut Company, New Haven, Conn.
- Detroit (Mich.) United Railway.
- Doherty Operating Company, New York, N. Y.
- East St. Louis & Suburban Railway, East St. Louis, Ill.
- Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.
- Grand Rapids, Grand Haven & Muskegon Railroad, Grand Rapids, Mich.
- Houghton County Traction Company, Houghton, Mich.
- Kansas City (Mo.) Railways.
- Keokuk (Iowa) Electric Company.
- Louisville & Southern Indiana Traction Company, Chicago, Ill.
- Middle West Utilities Company, Chicago, Ill.
- Milwaukee Electric Railway & Light Company, Milwaukee, Wis.
- Ohio Electric Railway, Springfield, Ohio.
- People's Railway, Dayton, Ohio.
- Pittsburgh (Pa.) Railways.
- Rochester Railway & Light Company, Rochester, N. Y.
- Shore Line Electric Railway, Norwich, Conn.
- Toledo Railways & Light Company, Toledo, Ohio.
- Virginia Railway & Power Company, Richmond, Va.

American Association News

The Mid-Year Meeting of the Association Will Be Held in Boston—President Storrs Made a Surprise Visit to the Public Service Section at Its Meeting on Oct. 19—Reports of Various Other Company Section Meetings Are Recorded

Boston Selected City for Next Mid-Year Convention

The city of Boston has been selected by the executive committee as the place for holding the next mid-year convention of the American Electric Railway Association, and the date has been set tentatively as Feb. 2. The meeting will be in general charge of Matthew C. Brush, president Boston Elevated Railway Company, who has been appointed by President Storrs to be chairman of the mid-year meeting and dinner committee.

Meeting of Denver Tramway Company Section

The first regular meeting of the Denver Tramway Company Section for the coming season occurred on Sept. 26 and was the thirty-seventh monthly gathering of the section. The paper of the evening was presented by A. M. Evans, assistant in charge of track, and described a trip of inspection recently made by him to the Pacific Coast. The paper which was illustrated by lantern slides gave an account of the standards and practice in Salt Lake City, Los Angeles, San Francisco, Oakland and Portland, and related particularly to the track standards in those cities.

Public Service Company Section Elects Officers

The first meeting of the Public Service Section was held in the new auditorium of the Public Service Terminal on Oct. 19. President Graham, division superintendent, of Camden, N. J., occupied the chair.

As a surprise to the members, L. S. Storrs, president of the Connecticut Company, who was recently elected president of the American Electric Railway Association, was present. He was introduced by Martin Schreiber and gave a brief talk on the future of the association. Harlow C. Clark, of the association office, then spoke on the activities of the association and characterized the meeting at Atlantic City as the best convention ever held by that body. Martin Schreiber, engineer maintenance of way, outlined a campaign for obtaining individual membership, and spoke of the success that the committee on individual membership had already achieved. L. C. Bradley of Houston, Tex., who was recently elected president of the American Electric Railway Transportation & Traffic Association, was scheduled to speak on training men for supervisory and executive positions but was unable to be present, having been called back to Texas on important business.

H. F. Burr, C. F. Backman, D. C. McDougall, F. L. Walsh and W. J. Hughes, who acted as delegates to the convention from the Public Service Railway, gave a short review of matters of interest to the members which pertained to their departments.

The annual election of officers which was then held resulted as follows: President, A. T. Warner; vice-president, H. D. Briggs; director, F. L. Folks; secretary, Frank Davis, and treasurer, A. H. Jones. Resolutions of sympathy for Messrs. Harrison and McCourt, who have been called to the great beyond since the last regular meeting, were passed.

Washington Railway & Electric Company Section Meeting

The meeting of the company section of the Washington Railway & Electric Company, Washington, D. C., was held on the evening of Oct. 16, and the principal speakers were W. F. Ham, vice-president of the company, and J. T. Moffett, superintendent of transportation, and the newly elected president of the company section. Mr. Ham reviewed the work done at the recent convention at Atlantic City. He also discussed the fare problem and referred to grants of higher fares than 5 cents in some New England cities. The talk of Mr. Moffett related principally to the subject of car standards. The following officers were elected to serve for the ensuing year: J. T. Moffett, president; William L. Clarke, vice-president, and L. B. Schloss and W. F. Degment, directors, and R. A. Vetter, secretary and treasurer. C. P. King, president, and W. F. Ham, vice-president Washington Railway & Electric Company, were elected ex-officio members of the board of directors.

Milwaukee Section Hears Announcement About Medal

At a meeting of the Milwaukee Company Section, held on Oct. 12, President Dentz announced the award to Bert Hall at the American Electric Railway Convention in Atlantic City for his paper on "Co-operative Activities," this being selected as the best company section paper read during the previous year and submitted in competition. The section then listened to an address by M. C. Potter, superintendent of schools, city of Milwaukee, who said he had been much impressed with the work being undertaken by the Employees' Mutual Benefit Association toward conserving the health of its employees. He also discussed the Page bill, which is intended to provide an appropriation for industrial schools in different cities.

After some musical selections Henry Grimm, of the claim department, read a short paper on current events in that department. The trials and tribulations of an investigator were described, and numerous instances were cited to show the unnecessary expenditure of money by the company because of insufficient information being furnished to the claim department. Before the close of the meeting the president announced that the nomination and election of officers for the ensuing year would take place at the next meeting, and that the way and structures department would prepare and read a paper on current events at that time.

Capital Traction Section Elects Officers

The annual election of the Capital Traction Company Section No. 8, American Electric Railway Association, was held on Thursday evening, Oct. 19, in the Assembly Hall, Thirty-sixth and M Streets, N. W. About 100 were present. After the meeting was regularly called to order by President Dalgleish, at 8.15 p. m., the following officers were elected for the ensuing year: President, F. Morrill; vice-president, Elon von Culin; secretary, J. E. Heberle; treasurer, A. Wilkinson; director

(for three years), John McKay. Each of the newly-elected officers was called upon and made a few remarks.

Col. C. W. Kutz, engineer commissioner of the District of Columbia and chairman of the Public Utilities Commission of the District, addressed the meeting on "Some Phases of the Engineering Work of the District of Columbia," illustrating his remarks with a number of lantern slides. The address included a description of the sewer department, street cleaning division, bridges, water service, trees and parking, and schools. He also spoke of the relations between the commission and the utilities and among other things said:

"The Public Utilities Commission was not created by Congress for the purpose of exercising an arbitrary jurisdiction over the utilities of the District, but was intended to act as an agency for doing justice to both the public and the utility companies, and this is the spirit which actuates the commission."

Col. R. D. Simms, treasurer of the company, and A. Wilkinson of the claim department, were called upon and entertained the section with a number of short stories. At the conclusion of the meeting a buffet luncheon was served.

COMMUNICATIONS

Newspaper Publicity Commended

SOUTHERN PUBLIC UTILITY COMPANY,
CHARLOTTE, N. C., Oct. 23, 1916.

To the Editors:

Since my return from the Atlantic City convention of the American Electric Railway Association I have taken the time to study carefully the papers presented on publicity and the discussion resulting from them, and I am struck with the fact that practically nothing was said concerning the use of newspapers by public utility companies. This, to my mind, was not an oversight on the part of those discussing publicity, but resulted, I believe, from the fact that the program of the Transportation & Traffic Association dealt with "Company Publications, Their Use and Value; and Their Preparation and Publication." Not even in the address of Mr. Lee, who is admitted to be a leader in corporation publicity, was there great stress laid upon the use of regular newspaper advertising, and it occurs to me that in future sessions of these associations it would be well to include in the discussion of this important subject the matter of using the newspapers of the localities in which the various newspapers are published.

It is true, undoubtedly, that there is a value to company publications, yet they do not nor can they take the place of the legitimate newspaper advertising. And I note with great pleasure and with full approval, the campaign of the ELECTRIC RAILWAY JOURNAL toward the frank discussion of the problems arising in the operation of public utility companies, through the newspapers, for the information of the general public which, as is manifest, constitutes our patrons and customers.

There is a danger, however, of the too free use of newspaper advertising by reason of the fact that it is an easy matter to leave the impression on the publishers of newspapers that the utility company is attempting to influence their attitude toward them and toward the public service. Such a situation is one which should scrupulously be avoided. A newspaper should at

all times, in my opinion, reflect public opinion. It is true that in some cases the newspapers attempt to make public opinion for reasons best known to themselves, and occasionally it is the case that they use their power in the community to the detriment of the utility company. But it has been my experience that the public is not to be hoodwinked in this regard for long at a time, and invariably it is the newspaper that suffers when a movement of this sort is attempted.

The newspapers should always be given the facts in the case, and after more than sixteen years' work with newspapers and newspaper men I have met but one who would refuse to deal fairly with the corporation and with the public. The newspaper which can be "controlled" by the utility company is not a friend of that company, no matter how strenuously it may strive to be. This is because the public will soon arrive at an understanding of the facts in the case and realize fully that the paper is not printing all the news but that it is deceiving its subscribers into believing that it is protecting their interests when, as a matter of fact, it is assisting the corporation to suppress facts of which the public should have knowledge.

At the same time every public utility company should use all the advertising space in its local newspapers that will bring results. There are several reasons for this, the first being that the American people read the daily newspaper, and if the utility company presents its position, day after day, through this medium, the public will eventually come to a better understanding of the facts and will be able to better judge between the claims of the demagogue and the representative of the company when controversies arise.

And another and important reason is that in every community, and I say this without fear of successful contradiction, the newspapers are community builders. They do more toward building bigger and better cities and towns and more to develop the latent resources of a section than all the boards of trade and chambers of commerce and rotary clubs ever organized. And with more people, better living conditions and increase in the wealth in a given section comes more business of a more satisfactory sort for the utility company. Therefore I say that the support of the local daily newspapers is a most essential means through which to add to the revenues of a company serving the general public, aside from the direct returns from the use of advertising space at a reasonable and fair rate.

It is true that occasionally it is good business to use advertising space in a newspaper that is manifestly unfair and unjust to the utility company? This is questioned in some sections, and I can readily understand the position taken and the reason for it. But if a newspaper is really unfair and unwilling to give the company a square deal, it is still possible that its readers do not form their opinion from its attitude, and advertising space relative to the use of electric and gas energy will oftentimes bring direct results. In cities in the Middle and Far West I have personally known this to be true.

The use of advertising space to educate the public concerning the abuses of public utility companies' property is one of the methods I have in mind. For instance, the practice of certain automobile owners and drivers to ignore municipal laws and regulations relative to the movement of traffic. Instances of accidents occurring as a result of these violations are numerous, and by using advertising space in the newspapers it is possible so to arouse public opinion as to lessen this danger, to say the least, if not to entirely eliminate it.

There are numberless ways in which the utility com-

pany may and should use advertising space in the newspapers, in connection with the company's publications, each of which will commend itself to the serious consideration of the management of every company when all the facts are known.

It is for these reasons that I suggest, through the *ELECTRIC RAILWAY JOURNAL*, that at some early session of the American Electric Railway Association and its affiliated organizations, arrangements be made for a discussion of the entire question of publicity from every possible angle.

LEAKE CARRAWAY,
Director of Publicity.

Accounting Inconsistencies and Fallacies

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Oct. 18, 1916.

To the Editors:

I have read with interest the editorial, "Facts—and the Wider Vision," in your issue of Oct. 14.

The public accountant who discussed inconsistencies and fallacies in commission accounting regulations at the Accountants' Convention devoted considerable time to criticizing the steam road classification of equipment rental accounts.

I am wondering if the speaker (Mr. Dunn) has read the electric railway classifications. If he were familiar with them and had known something of their history he should have known that the electric railway accountants persuaded the Interstate Commerce Commission long ago to avoid the very inconsistency regarding rentals which Mr. Dunn so sharply criticizes. I refer Mr. Dunn to Accounts Nos. 97, 98, 115, 116, etc., in the Interstate Commerce Commission System of Accounts for Electric Railways, issue of 1914, also your editorial entitled "Accounting for Rents" in the issue of Nov. 13, 1915, in which you say "the electric railway method of accounting for rents constitutes a real advance in utility accounting, secured through the earnest efforts of electric railway accountants."

Mr. Dunn waves a red flag and shouts "danger," figuratively speaking, at sight of "Surplus Appropriations" accounts in the classifications. These are about as dangerous, in the writer's opinion, as a man of straw. In the first place, their use is not mandatory, and, in the second place, I doubt if they are used by one railway accountant in fifty.

Mr. Dunn sends "a message to executives and directors to beware of appropriation accounts." I think most accountants, directors and executives pay little attention to these accounts, which are usually considered not nearly so important as the criticism would indicate. The surplus may be appropriated "at the option of the carrier," as clearly stated in the General Instructions of the Interstate Commerce Commission. If the appropriation accounts were used they would be memoranda and as such relatively unimportant. Mr. Dunn assumes that if such memorandum accounts were entered, the carrier might be stopped from later making any different disposition of the actual cash surplus by declaration of dividends or otherwise. I do not understand this to be the case. If a dividend had been earned and the directors decided to pay it, the situation would not be changed if some memorandum accounts had been made up concerning a tentative disposition or "appropriation" of surplus earnings.

Mr. Dunn also touches upon the subject of Sinking Fund Reserves, and he might well have devoted some time to specific criticisms of the treatment of Sinking

Funds, such as the Wisconsin requirement that accruals to Sinking Funds be charged against the monthly income account and the New York requirement that sinking fund accruals be included in a group of "Income Deductions Accounts."

Electric railway accountants are aware of the seeming inconsistency of the Interstate Commerce Commission treatment of depreciation accounting and the lack of harmony between features of the accounting systems prescribed by regulatory commissions, such as the Montana requirement that depreciation expense account shall cover "all expenditures for ordinary repairs, renewals or replacements," etc., and the provision by New Jersey and Maryland that amounts charged to the maintenance accounts for repairs shall be deducted from the amount estimated to cover the wear and tear, obsolescence and inadequacy for the period, crediting only the difference to depreciation reserve. None of these inconsistencies was mentioned in Mr. Dunn's interesting treatment of the subject.

An effort was made to procure advance copies of Mr. Dunn's paper, but this was not possible. Otherwise there might have been a very valuable discussion and some constructive, rather than destructive, criticism of some of the subjects mentioned in his address.

W. H. FORSE, JR.

Interurban Electric Railway Finances

MILWAUKEE, WIS., Oct. 21, 1916.

To the Editors:

Referring to the contributed comment by A. J. Boardman to the article on "Present and Future Development of Interurban Railways," contained in your issue of Oct. 7, I would suggest that the criticism is somewhat premature. This article and those succeeding are not intended to reflect upon the financial standing of any property but rather to indicate in a general way after a survey of the situation throughout the country some of the facts which have affected the development of the interurban railway and the more pressing problems now confronting it.

The statement "that the interurban is not a device for promoting the growth of communities," to which exception is taken is not exact, the actual quotation from the article being "The place of the electric interurban in the economic scheme of the country is that of a transportation agency and not primarily that of a device for promoting growth of communities. In so far as it may be self-supporting as a transportation agency, it may serve the other purpose as well, but privately owned it must earn or go out of business." While there are a number of towns that have been largely built up by the coming of the interurban, this does not alter the fact that the greater number have been disappointed in the fact that the actual development has not conformed to the anticipated growth of the towns served. The interurban has been dependent for its earnings primarily upon existing need for transportation rather than upon prospective town development.

Discussion of financial results will be contained in forthcoming articles. It may be pointed out, however, at this time, that many electric railway operators have found difficulty, under existing conditions, in building their lines at a figure of \$30,000 a mile, such as Mr. Boardman cites, and operating them with a ratio of 58 or 60 per cent for expenses, when there is included in expenses such items as taxes and reserves to insure the replacement of the physical property where it can no longer be economically repaired.

F. W. DOOLITTLE.

Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

Soldered Bonds Prove Reliable—Gas-Welding in the Car Shop—Safe Method of Supplying Current to Cars in the Shop—Third-Rail Bonding in New York Subway—Unloading Cars at Small Expense—Other Items of Practical Interest

Soldered Bonds Make Good Record

Seattle Railway After Twelve Years' Experience Believes This Type of Bond to Be the Most Reliable

BY E. J. MC ILRAITH

Superintendent of Way and Structures, Puget Sound Traction, Light & Power Company.

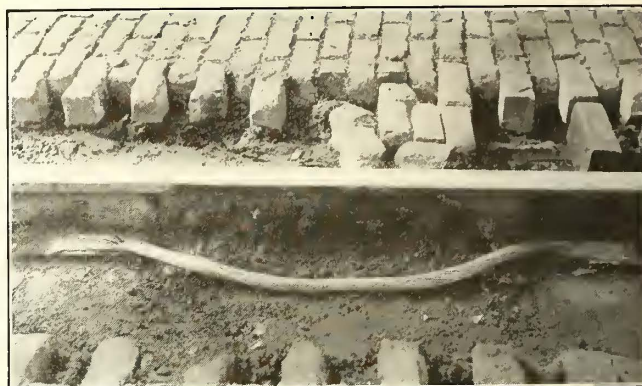
The Seattle (Wash.) Division of the Puget Sound Traction, Light & Power Company has been using only the soldered type of bonds for many years. Since this company is one of the few using soldered bonds, the performance data and costs of installation may be of interest.

Prior to four years ago, a considerable number of concealed bonds with solid formed ends were soldered to the web of the rail, but these were poorly installed, and many were stuck only at one end when placed. This type still shows a high percentage in the list of defective bonds. Others that run high each year, in the number giving high resistance, are the No. 00 exposed cable bonds that were put on at the time when bonds were considered merely a necessary evil, not an asset. We are replacing these rapidly as the loosening of the plates lowers the conductivity of the joint below our standard.

There are on the system of 203 miles of track 40,794 bonds, exclusive of those used around special work. These are tested twice each year at a cost of 0.375 cent per bond. On most of the track a resistance per bond equivalent to 12 ft. of rail is the maximum allowed before rebonding, but on tracks of heavy current flow 10 ft. is used. On this basis the defective bonds found in the last semi-annual test were classified as follows:

Type of Bond	Number of Bonds	Per Cent of Total Bonds Installed
2/0 cable (exposed) found too small.....	196	0.48
Concealed, formed and soldered.....	466	1.14
4/0 cable, broken strands.....	41	0.10
4/0 cable, poor contact.....	5	0.012
Cable bonds (exposed) stolen.....	55	0.134
New joints where rails were cut.....	41	0.100
Total	804	1.97

It is seen from the table that only 101 bonds of the class used mostly during the last twelve years have



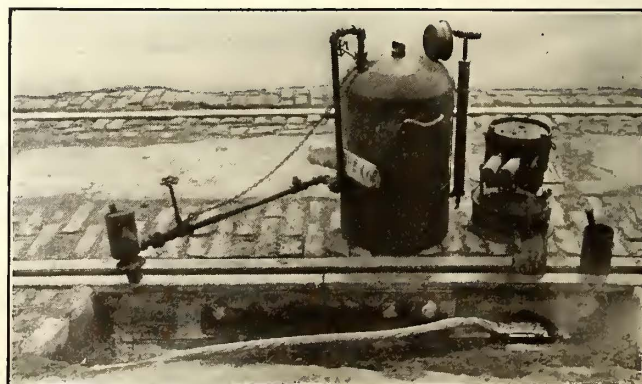
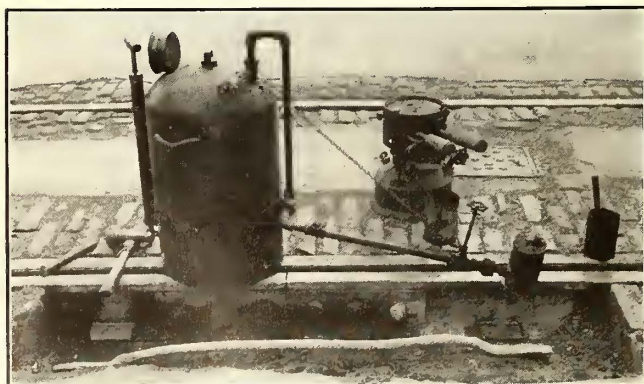
FINISHED INSTALLATION OF SOLDERED BOND

proved defective or have been stolen. This is about one-quarter of 1 per cent of the total number of the bonds now in use.

The cost of these bonds installed, with copper and solder prices about 25 cents per lb., and wages of men averaging 28 cents per hour, is \$1.50 per 350,000 circ. mil. bond and \$2 per 500,000 circ. mil. bond. The resistance per bond is 0.0001085 ohm and 0.0000740 ohm respectively. There is a little difference in the lengths of the two sizes as installed. The resistance of an equal length of 80-lb. rail using an 8-in. No. 0000 concealed bond, would be about 0.000065 ohm.

This company has had excellent service during the last twelve years from stranded cable, outside bonds soldered to the base of the rail. The cost per bond is high, but good reliability is obtained. The cost of replacing a defective concealed bond in paving is much greater than the cost of replacing an outside bond, owing to the bolt wastage, the extra paving disturbance and the removal of the joint plates, which cannot always be replaced in as good condition as before.

The writer does not feel that the records of other types of bonds can show the reliability per mile of track that a well soldered bond of this company's type is showing. Possibly a short gas welded bond placed on the head of the rail will prove equally desirable, and this type is being experimented with as the only one that in our opinion gives the same reliable, continuous



TWO STEPS IN THE APPLICATION OF A SOLDERED BOND, SHOWING METHOD OF HEATING THE RAIL

circuit. The cost for the same conductivity is about 45 per cent of that for the outside stranded cable bond.

Acetylene in the Car Shop

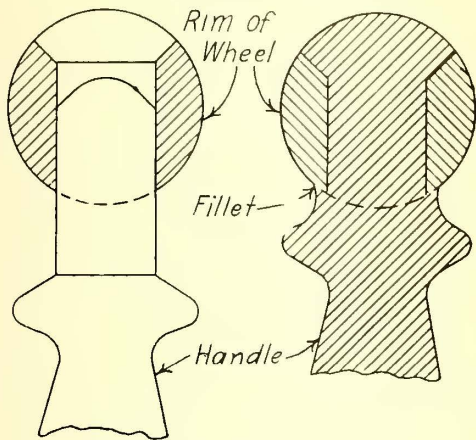
In Cutting, Softening and Welding, This Gas Proves Useful and Economical in the Shop

BY G. E. HAAR

Master Mechanic, Washington Railway & Electric Company, Washington, D. C.

In the shops of this company acetylene gas has proved useful in a number of ways and has been the source of a considerable saving of money. A few instances showing how we have utilized its properties may be of interest to readers of the *ELECTRIC RAILWAY JOURNAL*.

In cases where steel or iron is to be bent and a forge is not at hand or cannot be conveniently applied to the work, acetylene can be readily used for softening purposes. As an example, this company had a rectangular steel truck frame badly bent in a collision. To have taken it to the shop in this condition and taken it apart



TWO STEPS IN THE PROCESS OF GAS-WELDING BRASS HANDLES TO BRAKE WHEELS

for straightening and squaring would have been a time-consuming and expensive operation. A gas equipment was taken to the spot, the truck frame was heated, and by means of wrenches was promptly repaired in the yard.

Of course, there is no novelty in the use of the acetylene flame in cutting metals, and we naturally considered it in removing steel tires from wheel centers. However, we first found that if the flange was cut through and a shallow cut taken in the tread, a blow of a sledge-hammer would crack the tire through. Later we found that it was only necessary to cut through the flange, after which a short hammer blow cut the tire instantly. This is our present practice in removing tires, and the time required is practically negligible as compared with the practice formerly used.

An example of acetylene welding which interested the writer very much personally was as follows: The Public Utilities Commission of the District of Columbia ruled that the brass brake wheels which were used on a number of the cars must be provided with handles. To have changed the wheels would have cost about \$20 net per car, and the expense involved was sufficient to cause us to consider carefully other possibilities. The following plan was adopted so that brass handles were added to the wheels at a cost of about 90 cents per car, including all labor and materials.

As shown in the accompanying diagram, the rim of the wheel, which was 1 1/4 in. in diameter, was drilled through for a tight fit with a 3/4-in. projection on the

end of the handle. One side of the hole was chamfered out. The handle was then pushed into place and the brass was puddled by means of the flame, as shown, welding one side of the rim firmly to the projection of the handle. A fillet was also welded around the junction of the handle proper and the other side of the rim. After the welds had been smoothed over there resulted a wheel and handle as good as if the two had been cast together.

Another operation worth mentioning was the cutting of a 36-in. I-beam used in connection with the old power house and directly in the path of our underground construction for the new extension on Fourteenth Street from F Street. It took one man three hours to make two cuts on this I-beam, and 110 cu. ft. of oxygen and 50 cu. ft. of acetylene were consumed.

In our work we use what are designated as No. 4 to No. 10 tips, a tank containing 100 cu. ft. of oxygen, and an acetylene tank containing 225 cu. ft., or 15 1/2 lb., of acetylene. The oxygen and acetylene costs about 2 cents per cubic foot.

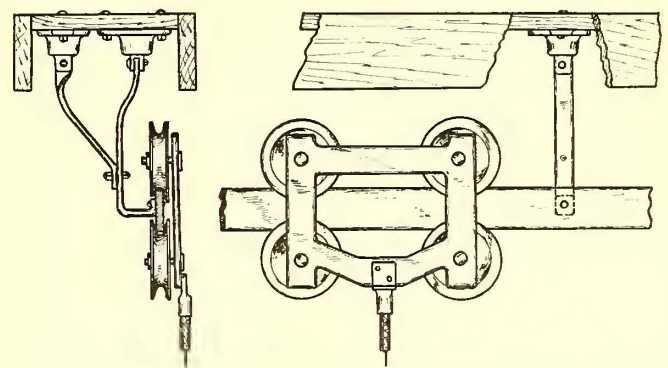
A Movable Carriage for Current Collection

Convenient Method of Supplying Current to Cars Not Equipped for Trolley Operation

BY G. B. TANIS

Electric railway operation offers many problems which usually do not submit themselves to simple solutions. The design of a contact system for furnishing current to moving equipments in yards and shops presents a typical case, particularly when the cars are not adapted for trolley operation. Some third-rail equipments are provided with trolley poles, in which case standard overhead construction can be used. The presence of a live rail near the track is not only dangerous in a shop, but it is a hindrance to the men in doing their work.

A surface depot with which the writer is familiar was recently converted into a shop for inspecting subway cars, making it necessary to devise some scheme for



MOVABLE CARRIAGE TO SUPPLY CURRENT FOR OPERATING CARS IN THE REPAIR SHOP

delivering power to the cars. This was accomplished by substituting for the trolley wire an iron bar, on which was mounted a movable carriage, current being supplied to the third-rail shoes through a No. 0000 lead connected to the carriage which is drawn forward as the car moves along the track.

The iron bar is of 3 in. x 7/16 in. wrought iron, and extends the entire length of the shop. It is supported by brackets bolted to standard trough hangers, which in turn are bolted to the wooden trough formerly used for the trolley. The brackets are made of two 1 1/4-in. x

5/16-in. pieces of wrought iron erected as shown in the sketch. The carriage is composed of four standard trolley wheels held in position by a forged yoke of wrought iron. To this yoke the lead is connected by an ordinary terminal. The end of the lead which connects to the car shoe has a spring clip attached so that it can be easily snapped on or off as desired.

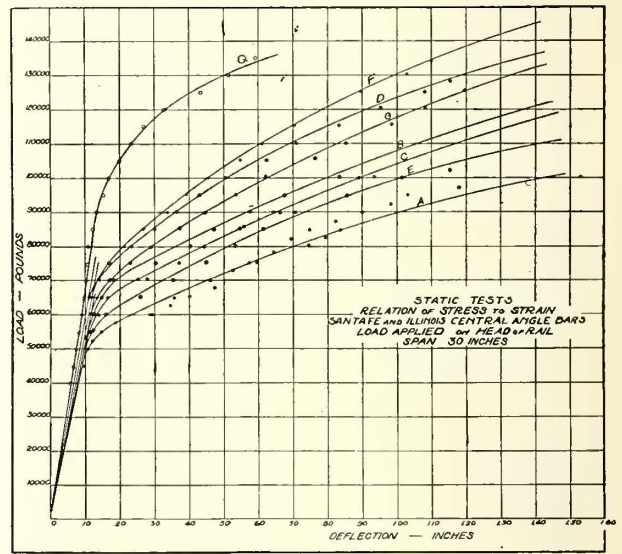
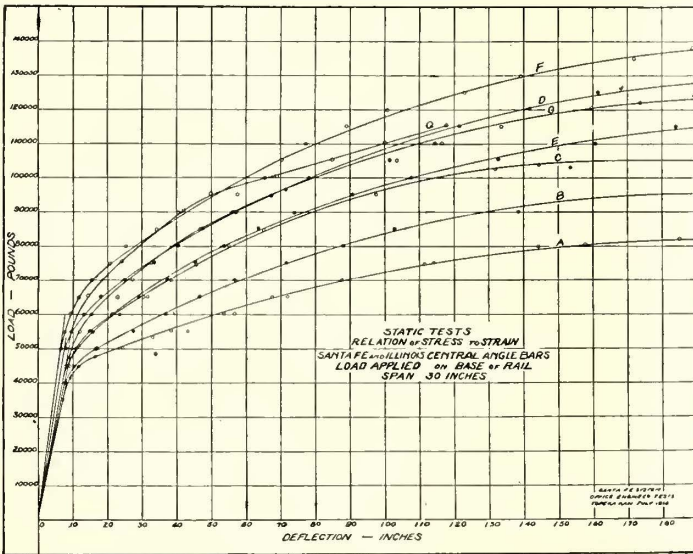
Rail Joint Tests in A. R. E. A. Bulletin

The August, 1916, bulletin of the American Railway Engineering Association, recently issued, contains some studies by M. H. Wickhorst, engineer of tests of the rail committee, on the strength of angle bars with varying carbon content and of quenched bars, and also on the strength of oil-quenched, medium-carbon steel track bolts as compared with untreated, low-carbon steel track bolts. The material used in the test included forty-eight pairs of bars, forty-two of which were Santa Fé Railroad's experimental angles of different carbon range, and six were Illinois Central Railroad's medium-carbon quenched bars.

Both static and drop test were used. In the static test, the angle bars were bolted to two 90-lb. Santa Fé standard rail sections, about 3 ft. long, and the joint

slightly over 1 in. apart at the bottom. After the rails had been deflected so that the ends came together at the top, the bars would tend to shear the bolts on being deflected further. As a result of these tests the bars were badly distorted, a condition which is shown in a number of illustrations which accompany this report. For the low-carbon steel bolts three of the four joints failed by shearing the bolts, all failing on the third drop. For the oil-quenched bolts two of the four joints failed from shearing of the bolts, and both these two joints failed on the fourth drop. These data show that the oil-quenched bolts offer greater resistance to shear than the untreated low-carbon steel bolts.

As a result of these tests the following conclusions were drawn: 1. The strength and rigidity of the track joint are dependent on the strength of the joint bar. 2. The strength of material varies with the carbon content when other elements are constant and the material is handled in the same manner regarding heat treatment and quenching. 3. Proper quenching of the material raises both the yield point and the ultimate strength of the steel and results in a stronger joint, as pointed out in the comparison of the quenched medium steel bars with untreated bars having the same composition. 4. The strength and rigidity of the joint are influenced



RESULTS OF TESTS ON RAIL JOINTS WITH LOAD APPLIED AT HEAD AND BASE OF RAIL

was supported by heavy knife edges set 30 in. apart on the bed of a 200,000-lb. Olsen testing machine. The load was applied at the center of the joint by means of another knife edge and a suitable block to simulate wheel pressure. The bars were bolted together on the rail so as to allow a 3/8-in. opening between the rail ends, and the bolts were stressed to approximately 20,000 lb. Care was exercised to have a good fit between the angle bars and the rail.

In the drop test the bars were bolted to 90-lb. Santa Fé rail sections as in the static tests. The joint was placed on the supports of an M. C. B. drop-test machine, using a 36-in. span. A 2000-lb. tup was used with a fall of 8 ft. 6 in., which is one-half the height required by the American Railway Engineering Association specifications for 90-lb. rail. The results of the static test with the load applied on the head and on the base of the rail are shown by the two sets of curves herewith. The letters on these charts indicate different sets of bars.

In the drop test the bars were given a succession of drops on the head or base until failure resulted. The bars were deflected on the first drop to an extent that the rail ends were usually together at the top and

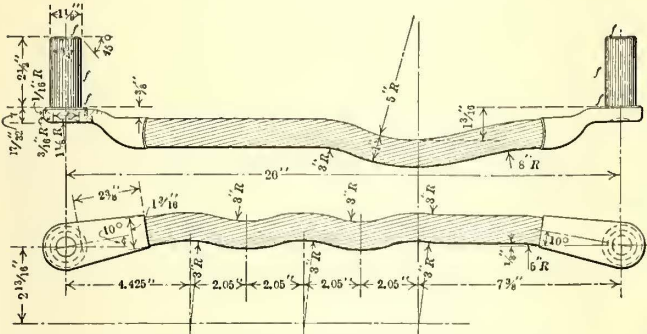
to a slight extent by the strength of the bolt, both in static and dynamic tests, showing in favor of the oil-quenched, medium-carbon steel bolt over the untreated, low-carbon steel bolt.

3,000,000 Circ. Mil Bonding for New York Subway Third-Rail

The bond shown in the accompanying illustration has been developed for the bonding of the 150-lb. third-rail which is to be installed by the Interborough Rapid Transit Company on its portion of the dual system of rapid transit of New York City. The bond is of the compressed terminal cable type, 20 in. long and made up of 127 strands having a combined cross-section of 750,000 circ. mil. Four of these bonds, placed two on each side of the rail, are to be used at each joint, giving a total cross-section of 3,000,000 circ. mil. The bonds are being made by the Ohio Brass Company, and this will be the heaviest compressed terminal bonding on record.

The web of the rail is 2 3/8 in. thick which is said to be the greatest thickness on which compressed terminal bonds have been used. For installing the bonds a

special, hand-operated, hydraulic compressor has been developed. Oil is the liquid used and the pressure is raised to 45 tons before the terminal is released. By an attachment on the compressor, a tape is punched when the required pressure is reached. As the terminal is not released until the tape is punched this device insures that the bond is installed with the required 45-ton pres-

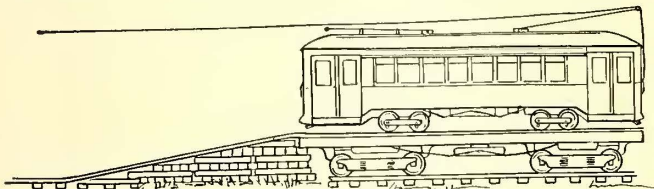


BOND TO BE USED ON 150-LB. NEW THIRD-RAIL OF INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK CITY

sure. Tests made by sawing through the rail and bond show that this pressure is sufficient to give good contact between the copper and the rail. If it should be necessary for any reason to release the pressure before the compression is complete, this can be done by opening an emergency valve.

New Cars Unloaded Without Special Apparatus

The accompanying illustration shows the scheme used by J. L. Brown, master mechanic, Dallas (Tex.) Consolidated Electric Street Railway, for unloading a shipment of thirty-five cars. A location in the company's spur track was selected where the joints in the rails were opposite each other. The splice plates were unbolted, and the track was raised by cribbing up in



SKETCH SHOWING TEMPORARY TRACK CONSTRUCTION FOR UNLOADING CARS

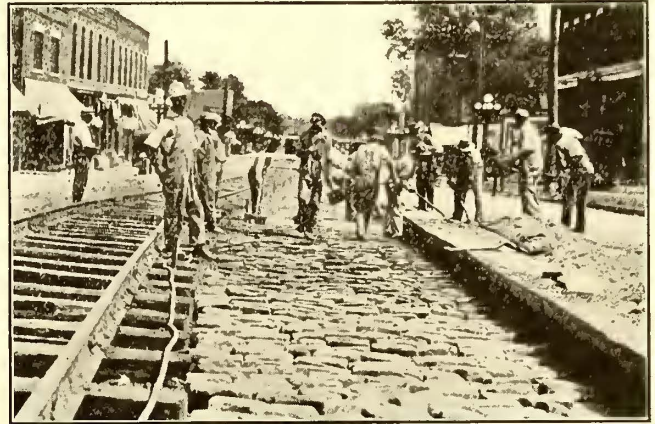
the manner shown. The flat cars on which the new cars were shipped were run up to this scaffolding where a temporary connection was made with the nearby trolley wire, and the cars were unloaded by their own power. Three men were kept busy knocking off the blocks which held the cars on the flats, and two motormen ran the new cars to the car-house. With this method of operation the average time required to transfer a car from the flat car to the carhouse was sixteen minutes.

A machine for forming elliptic springs has recently been put on the market by Joseph T. Ryerson & Son of Chicago, Ill. It is known as the "Riley Universal Elliptic Spring Forming Machine," and is primarily designed for railroad spring shop use. In the operation of this machine, the hot spring leaf, is formed next to the cold plate against which it fits in the spring, thus giving an accurate camber to the hot leaf.

Railway Uses Old Sandstone Blocks for Paving Foundation

In doing its repaving, the Topeka (Kan.) Railway is using as a base, 6-in.x6-in.x8-in. Colorado sandstone blocks which have been in use in the paving since 1886. These old blocks would otherwise have been thrown away or broken up for use in concrete.

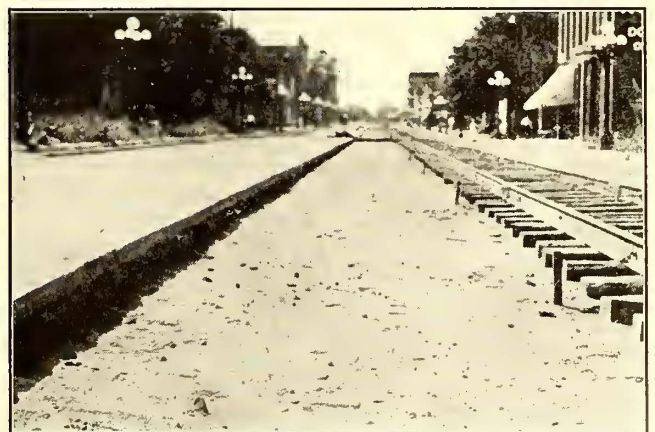
In paving a street the track is shifted to one side, and a 2-in.x9-ft. trench in dug. The sandstone blocks



GROUTING SANDSTONE BLOCKS ON TOPEKA (KAN.) RAILWAY

are laid on a 1-in. layer of cinders and thoroughly grouted. One of the accompanying illustrations shows a gang of laborers mixing the cement and brushing it into the crevices between the blocks, while the other picture shows the sandstone blocks after the grouting has been done. After the completion of the grouting the track is moved back onto this foundation and the space around the ties is filled in with Joplin chats. Spread over this foundation is a 3-in. course of concrete which joins on either side the concrete foundation installed by the city. On top of this the regular sand cushion and brick block paving is laid the full width of the street.

The Topeka Railway has 10 miles of track on streets



SANDSTONE FOUNDATION READY FOR INSTALLATION OF TRACKS TOPEKA (KAN.) RAILWAY

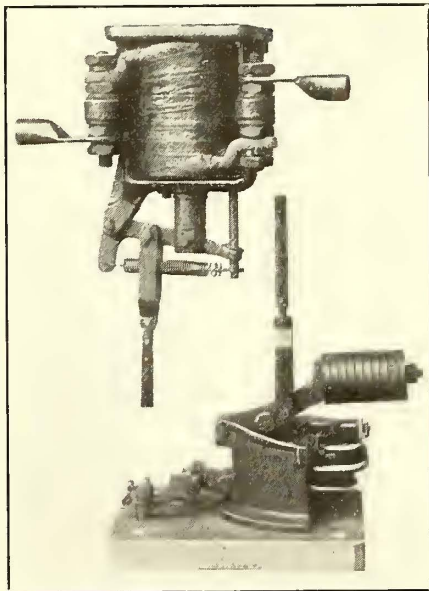
having sandstone block paving, and in the future it is planned to do the repaving in this manner. The new paving is permanent in character and less expensive than solid concrete, and it is the opinion of the company that it will cushion the rail better than the solid type of construction.

A High-Voltage, Overload Relay for Alternating-Current Circuits

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently placed on the market type HB overload relay for high voltage alternating-current circuits of any frequency.

This relay consists of a strongly built solenoid mechanism which operates a timing and circuit-closing element through a micarta chain of such length as to provide ample insulation for the voltage in use. There is no lost motion in the chain as it is constantly in tension, the action of the solenoid raising a weight on the contact mechanism. For voltages up to 44,000 the chain consists of twelve links. Twenty links are provided for voltages up to 66,000, and thirty links up to 110,000 volts. The links may be removed to shorten the chain down to a minimum of one link for each 6600 volts.

The relay coil is inserted in the high-voltage line, but the contacts and timing parts are thoroughly



SOLENOID MECHANISM OF OVERLOAD RELAY; BELLOWS AND VALVE BELOW

insulated and can be handled, adjusted or tested without disconnecting the feeder. The coil can be mounted on a disconnecting switch or choke coil and the use of separate insulators avoided, while the contact mechanism can be mounted in the position most convenient.

This HB relay is furnished in two forms—one having an inverse time element, the other a definite time element. The inverse time-element relay can be set to act practically instantaneously. In this form of relay the solenoid and chain are opposed in their motion by a bellows with an adjustable valve. The valve has a small numbered dial which permits of any setting between a maximum time element of about twenty seconds at 25 per cent overload and a minimum of about one second at the same overload. With greater overload the relay acts in a shorter time.

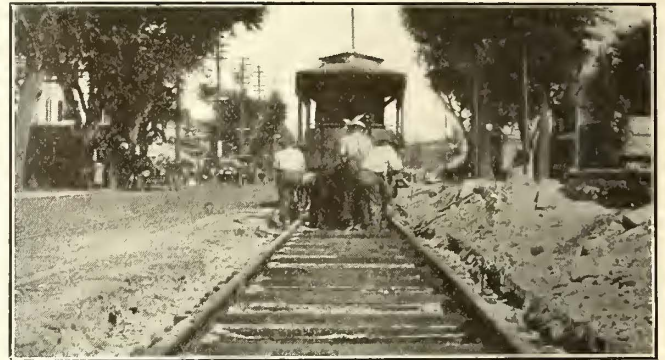
In the definite time-element relay the same kind of bellows and valve are used as for the inverse time limit, but the solenoid chain does not act directly on it. As these relays are controlled by bellows they are not as accurate as to time element as magnetically damped relays. Their time element will be found sufficiently accurate to afford protection on the circuit to which applied, though selective protection with regard to other circuits in the system cannot always be satisfactorily obtained.

This relay is intended for mounting on a disconnecting switch or other support on the high-tension line. One relay is required to protect a single-phase circuit, two relays for a two-phase or three-phase ungrounded neutral circuit, and three relays for a three-phase grounded neutral circuit.

Girder Rails Replaced by T-Rails in Cambridge, Mass.

The Boston Elevated Railway in reconstructing 2200 ft. of track on Massachusetts Avenue, Cambridge, Mass., is replacing 9-in. girder rails with 95-lb. Lorain Steel Company, section No. 400, T-rail, 7 in. high.

The accompanying illustrations show the work in progress. Creosoted hard pine ties measuring 7 in. x 7 in. x 7 ft. are laid with 2-ft. spacing on a 3-in. founda-



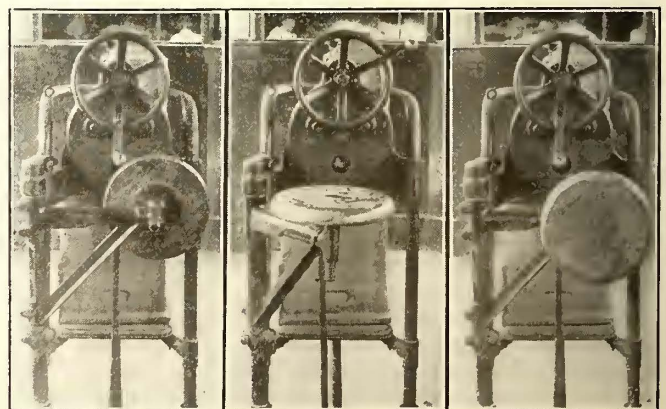
BALLASTING T-RAIL TRACK IN CAMBRIDGE, MASS.

tion of stone ballast. The tracks are laid with tie rods spaced every 5 ft., and four lag screws per tie hold the rails to the ties. Crushed stone is filled in between the ties to a depth of 2 in. and tamped, pneumatic tie tampers being used. On top of the crushed stone is a concrete slab, the mixture being one part cement to six parts gravel taken from the street. In mixing only a little water is used.

A layer of beach sand, 1 in. to 1½ in. in thickness, is spread over the ties to form a cushion for the 5-in. granite paving blocks. These are laid in an arch form so that the paving in the center of the track is level with the top of the rail. This is a crown of 1¼ in. The paving is then flooded with thin grout and swept. On completion of this work there will be about 10 miles of this general type of track construction on the system.

Conductor's Seat Made Adjustable

The adaptation of any one of the conductors' folding seats that was on the market to the different types of cars of the Northern Ohio Traction & Light Company, Akron, Ohio, was found to be impractical, and accordingly P. J. Wood, master mechanic, designed and built one of his own which is now being manufactured and sold by the Cleveland Trolley Supply Company, Cleve-



THREE POSITIONS OF SEAT USED BY CONDUCTORS ON THE NORTHERN OHIO TRACTION COMPANY

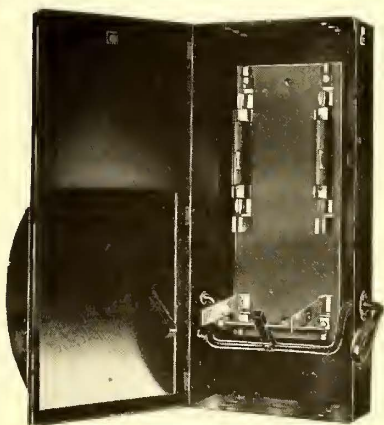
land, Ohio. This seat has been adapted to an ordinary prepayment-fare stand. It consists of a malleable iron bracket supporting the seat itself and attached to a pipe standard. The distance between this standard and the standards supporting the fare box is adjustable, and the position of the seat bracket on its supporting standard can also be varied. The supporting bracket revolves about the pipe standard, and its position may be fixed in the space back of the fare box or swung around in position for the conductor, or it may serve to obstruct the exit aisle.

The seat proper can be adjusted to any height within the range of the length of the screw upon which it is mounted, and may be fixed in a horizontal position, or swung to a vertical position on either side of the bracket as shown in the accompanying illustrations. The latching is accomplished by a tip on the casting which supports the seat. This fits into three different slots in the end of the horizontal member of the malleable iron bracket proper.

Improved Safety Switch

An inclosed, theft and fool proof, safety switch designed to replace the dangerous, exposed switch on 600-volt railway circuits has recently been placed on the market by the Western Electric Company, Chicago, Ill.

As shown in the illustration herewith, this switch is inclosed in a metal box provided with a hinged cover which is held closed by a spring latch. The switch



IMPROVED SAFETY SWITCH

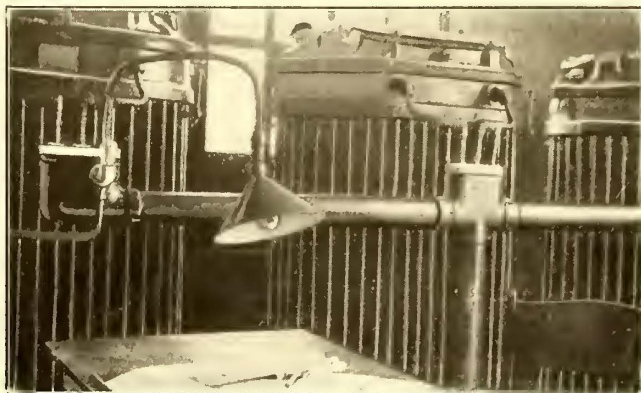
terminals and fuses are under lock and key, and while the current can be turned on or off by means of the handle outside the box, the current carrying parts and wiring remain inaccessible. This prevents the theft of current, which is generally accomplished by wiring around the meter. The switch mechanism is of a quick-break type. When the door is closed, a gasket in the lid renders the box fire and waterproof. This switch has a maximum capacity of 600 amp. on 600 volts.

An innovation in country elevator structures has been introduced on the Illinois Traction System at Evans, Ill., where there has been erected a concrete and steel tank elevator. A round steel tank 26 ft. in diameter, 45 ft. high and weighing 40,000 lb. is divided into four bins, each holding 3000 bushels. The first story or working floor, under the tank is of concrete reinforced with steel and the structure is rat and mouse proof, as well as fireproof. This is one of twenty-five grain elevators ranging in capacity from 10,000 to 50,000 bushels along the lines of the Illinois Traction System.

Special Outlets for Conduit

The conduit wiring for transformers as shown in the accompanying illustration is a feature of the South Deerfield (Mass.) substation of the Greenfield Electric Light & Power Company, which supplies power for the Connecticut Valley Street Railway at this point by use of a motor generator set.

The installation consists of three 100-kva. General Electric oil-cooled units, delivering current at 4600 volts for local distribution and receiving 13,200-volt energy from the Greenfield company's local transmission net-



CONDUIT OUTLET WITH RECEPTACLE FOR PILOT LAMP AND CONNECTION FOR OPERATOR'S DESK LAMP

work. Both primary and secondary leads are wired in pipe duct, with Crouse-Hind "condulet" fittings, the arrangement providing an unusually compact installation. A special feature is the provision of an outlet in one of the "condulets" over the operator's desk to carry a lamp feed from the substation lighting circuit supply. The outlet also carries a receptacle holding a 10-watt lamp which serves as a pilot when the station is otherwise darkened for that portion of the night after a railway motor-generator set in the room has been shut down. A swinging lamp bracket over the desk is threaded into the outlet for convenient handling and the provision of a metal reflector and 40-watt lamp enables the operator to read the watt-hour meters installed on the switchboard 12 ft. away without carrying lamp cord and portable unit about the substation.

Delivering Hard-Road Material on the Ohio Electric

Crushed stone for hard roads or other purposes is being handled in large quantities by the Ohio Electric Railway, Springfield, Ohio. This material is delivered from quarries located on this company's lines and from connecting steam railroads. Cars loaded with crushed stone are usually handled by the regular freight trains, but in a number of instances special switching service is required to make deliveries. The crushed stone is loaded into side-dump cars, flat-bottom gondola cars and hopper-bottom gondola cars. The hopper-bottom cars are dumped into pits on side tracks, the gondola cars are set out on side tracks, the side-dump cars are delivered at any specified points along the right-of-way, and the material is unloaded by hand shoveling. When side-dump cars are unloaded from the main line, they are handled by a switching locomotive between the regular scheduled trains. An embankment along a highway is the most desirable location for unloading crushed stone from side-dump cars. The convenience of deliveries made in this way has been a large factor in the railway's obtaining this class of freight.

NEWS OF ELECTRIC RAILWAYS

MR. CLARK MAKES PLEA FOR FAIR TREATMENT Course Outlined Necessary to Restoring Confidence in Municipal Attitude Toward Portland (Ore.) Company

C. M. Clark, Philadelphia, Pa., chairman of the executive committee of the Portland Railway, Light & Power Company, Portland, Ore., was the guest of honor and the chief speaker at the weekly luncheon of the Progressive Business Men's Club of that city on Oct. 12. Mr. Clark's principal topics were the jitney, the attitude of the Pacific Coast toward the Eastern investor and the competition in the lighting field in Portland. He said that there was a growing concern among Eastern investors over the apparent lack of interest on the Pacific Coast in the rights of those who have furnished funds for the development of the resources of the West, and he referred to the need for refinancing which will present itself to the company through the maturity of \$5,500,000 of notes on May 1, 1917. He said that while the Pacific Coast was the great home of the jitney, he thought that the climate has very little to do with its prevalence there. The reason for its existence was the way Pacific Coast cities were governed and the lack of thought or responsibility in the public mind to property interests and to franchises already given. The chairman of the meeting had made that suggestion. Otherwise, Mr. Clark said, he would not have spoken of it, but there was an obligation of a municipality to a franchise contract under which vast sums of money had been invested. He thought the chairman made a good point and was glad to enlarge upon it. He considered the inadequate control of the jitney on the Pacific Coast to be a reflection upon the government of the Pacific Coast cities.

In Mr. Clark's opinion, the city of Portland or any other city could never be served adequately by the jitney service. He did not believe any of the gentlemen present thought it could, nor did he think the Council of the city of Portland thought that it could. If there was any question as to the correct answer to that interrogation, undoubtedly the proper thing for the Council of Portland to do was to grant a franchise to some responsible jitney organization and let them try it out. In granting such franchise the very smallest consideration for fair play and for common municipal honesty would require that any ordinance for a single jitney or a combination of jitneys to operate in Portland should contain restrictions, regulations, taxation, etc., similar to those under which the Portland Railway, Light & Power Company operated. That was the least obligation which the city government of the city of Portland owed to vested interests. All that the stockholders of the Portland Railway, Light & Power Company wanted from the city and the people was fair play and the same treatment as was received by its competitors. If the Council granted a franchise to a jitney organization or to individual jitney drivers, giving them privileges and concessions and conditions which were decidedly more favorable than those received by the Portland Railway, Light & Power Company, that company would expect exactly those same concessions.

In referring to the financial situation, Mr. Clark said that to his mind it was the crux of the whole matter. The financial history of the past few years of the Portland Railway, Light & Power Company had been absolutely disastrous. Since 1913 practically the entire surplus earnings had been taken away from the company through absolutely no fault of its own, except that the company had expanded to take care of the growth of the city of Portland which was indicated by its previous history. That was a mistake and the company owned up to it. The bonds of the company, which three years ago were worth 97½, Mr. Clark bought that week for 70. The two-year notes of the company, which come due next May, \$5,000,000 of them, were offered at present at 90. The stock, which was in the

seventies and eighties, before assessments of 10 per cent were called, was now at nine, after payment of \$10 a share in assessments. He was asked constantly the question, "What under the sun is the matter with Portland?"

As to prospects Mr. Clark said that if the jitney was removed the company would immediately get back the business which belonged to it before. If good times came again the company would get back what it lost through the industrial depression, and could then go ahead and attend to business. As for the competition of the Northwestern Electric, the Portland Railway, Light & Power Company would never get back its loss from that source, but with the growth of the demand for electric light and power it may be able to build up enough business for both, although it would probably take a great many years to do it.

NIAGARA & EASTERN TO REAPPLY FOR CONSTRUCTION RIGHTS

Despite the action of the Public Service Commission for the Second District of New York, which has denied a certificate of convenience and necessity to the Niagara & Eastern Railroad, Lockport, N. Y., for the construction of an electric railway to connect the Buffalo, Lockport & Rochester Railway with the Niagara frontier at a point where it is proposed to build a new international bridge across the gorge at the Devil's Hole, Judge Charles Hickey, Lockport, president of the line, says a modified application will immediately be made to the commission.

The construction of the proposed line is embodied in a comprehensive plan which would involve the expenditure of several millions of dollars in electric railway properties throughout western New York and in Canada between Toronto, Ont., and the Niagara frontier. Surveys have been made and options have been obtained for a tentative right-of-way between Hinman, N. Y., on the Buffalo & Lockport division of the International Railway, and a point on the Niagara gorge near the Devil's Hole. Property has been bought on the American and Canadian sides of the gorge near this point for abutments for the proposed international bridge.

The road is being promoted as a connecting link in the new transcontinental line, involving the extension of the Canadian Northern Railway from its present eastern terminus at Toronto, Ont., to the Niagara escarpment, where a new international bridge would connect it with the proposed Niagara & Eastern at the Devil's Hole, then to Hinman and Lockport and over the Buffalo, Lockport & Rochester Railway to Rochester, where it would connect with other eastern systems.

Commissioner Devoe P. Hodson, Buffalo, who wrote the commission's majority opinion, from which only Commissioner William Temple Emmet dissents, says that the possibility of consummating the connections across the Niagara gorge and with the eastern terminus of the Canadian Northern in Toronto, 80 miles away, is too remote to be considered in its present application. Without this connection the commission finds that there would be no public necessity for the Niagara & Eastern line as a whole from Lockport to the gorge. While intimating that the commission might consider a future application for a certificate for that part of the line which would connect the Buffalo, Lockport & Rochester Railway with the International Railway and the Erie Railroad at Hinman, Commissioner Hodson finds the commission is without power under the law to separate the present application into two parts.

President Hickey of the Niagara & Eastern Railroad is quoted as stating that the new line will be financed by interests identified with the International Railway, Buffalo, and declares there will be no delay in making another application to the commission in a somewhat modified form.

ADDITIONAL TIME IN TACOMA CASE

Mayor of Tacoma Attacks Motives of Tacoma Railway & Power Company in Seeking Relief from Franchise Provisions

By an order of the Public Service Commission of the State of Washington, the city of Tacoma has been granted an additional twenty days in which to answer the complaint of the Tacoma Railway & Power Company, in which the company asks to be relieved by the Public Service Commission from various franchise obligations. Mayor Fawcett, of Tacoma, quoting from the petition of the company the paragraph setting forth that "it is impossible for the plaintiff to continue to operate its street railway lines for a 5-cent fare throughout the limits of the city of Tacoma, to maintain its present service," etc., answered the charge of Louis Bean, manager of the company, with the rejoinder that the Stone-Webster subsidiary, in its complaint, is attempting to bring about an increase in its fares on lines extending to outlying points.

Mr. Bean, in answering the statement made by the Mayor, said in part:

"In the statement appearing in local papers, with reference to the so-called 'relief petition' of the Tacoma Railway & Power Company, the Mayor has stated in effect that the company was seeking to raise fares to Fernhill, Larchmont, South Tacoma, Point Defiance, etc. His statement is entirely without foundation. It is our understanding that at this time the State law prescribes a 5-cent fare within the limits of incorporated cities. For the information of the public, we present herewith our prayer in petition for relief:

"Wherefore, the plaintiff craves that a citation be issued directed to the city of Tacoma, requiring it to answer this complaint, and that a hearing thereon be had; that an order be entered relieving the plaintiff from any obligations to pay any gross earnings tax, and from contributing to the cost of bridges, to pave or pay therefor; from maintaining and repairing streets; from furnishing any free transportation, and that the plaintiff be relieved from any further provisions of the franchises under which it operates, except to give adequate and sufficient service at fair and reasonable rates."

Mayor Fawcett, in return, said in part:

"Manager Bean says he did not ask the commission for increased fares. Stone-Webster's manager would not be so crude as to blurt out: 'We want 10-cent fare to Fernhill and South Tacoma.' He knows what a row that would have made. Mr. Bean publishes the prayer of his petition to show he didn't ask it. Please note the last line of the prayer: 'at fair and reasonable rates'! What does that mean? Hasn't this city been entertained ever since the Fernhill fight with mournful bleatings of street railway officials that a 5-cent fare is not a 'fair and reasonable rate' to Fernhill and other outlying districts?

"Again, in its plea to the commission, after recounting the things the franchises require the company to do, it says: 'It will be absolutely impossible for the plaintiff to comply with such provision and to charge only a 5-cent fare within the corporation limits of the city of Tacoma.' Oh, no! Mr. Bean did not ask for a fare boost. He just fixed it so the commission would either have to commit hari-kari or else give it to him as the only solution to his company's distress. The people have got to elect a Legislature that will wipe out the Washington Public Service Commission."

City attorneys Dan F. North of Bellingham, William A. Johnson of Everett, Hugh M. Caldwell of Seattle, J. M. Geraghty of Spokane, City Attorney Harmon and Assistant Attorney Carnahan of Tacoma, together with Mayor Fawcett and the Tacoma City Commissioners met in secret session in Tacoma recently to perfect plans to unite against the company's petition. If the Public Service Commission decides against the city, a writ of prohibition will be sought in the Superior Court at Olympia, thus taking the question out of the hands of the Public Service Commission. If this defense is lost, the city of Tacoma will then have to answer the complaint before the Public Service Commission.

IMPORTANT SUBURBAN FRANCHISE RENEWED

Blue Island (Ill.) Grants Twenty-Year Extension of Rights to the Chicago & Interurban Traction Company

The Chicago & Interurban Traction Company, which operates an interurban line from Vincennes Avenue and 119th Street, the city limits of Chicago, to Kankakee, Ill., has accepted a new ordinance passed by the City Council of Blue Island extending its rights in that city for a period of twenty years from the date of passage of the ordinance. The former ordinance, which was originally granted to the Englewood & Chicago Electric Street Railway and the only franchise of brief duration held by the Chicago & Southern Traction Company when the present company acquired its property outside the city of Chicago in 1912, expired in February, 1916.

The acquisition of the extension franchise is of particular significance to the company in that its rights in Blue Island were attacked by the city authorities shortly after the organization of the Chicago & Interurban Traction Company in 1912, and recourse to the courts was necessary to prevent interference with the operation of the company's cars. The new ordinance disposes of all matters in controversy between the company and the city.

Reconstruction of the company's double track lines will be carried out under a three-year program, with 91-lb. 7-in. T-rail on wood ties set in concrete, with furnace slag or crushed stone foundation and granite block paving. Specifications are included in the ordinance. The tracks in Burr Oak Avenue and Western Avenue are to be reconstructed in the first year, the Calumet Grove line the second year, and the Vincennes Avenue tracks the third year. The company will furnish on all of its poles on Western Avenue and on certain poles on Burr Oak Avenue and Vincennes Avenue brackets to carry lights to be furnished by the city, and wires for the police and fire-alarm systems.

Service regulation by yearly terms is provided for by agreement between the president of the company and a representative of the city to be appointed by the City Council. If the two cannot agree, an arbitrator is to be appointed by the City Council and the president of the company, and the findings of a majority of the arbitration board thus created will bind the company, a thirty-day period being given in which to carry new schedules into effect. It is intended that the first schedules thus established shall go into effect about Jan. 1, 1917. In the meantime the schedules are to be as prescribed in the ordinance, the week-day schedule varying from a ten-minute headway between 6 a. m. and 7:20 a. m. and 4:30 p. m. and 6:40 p. m., with a twenty-minute headway during the middle of the day to a maximum headway of eighty minutes between 1:30 a. m. and 4 a. m. The present fares remain unchanged.

In the event of annexation of the city of Blue Island to the city of Chicago, the company agrees to sell its lines within the annexed territory to the Chicago City Railway.

CITY AND COMPANY AGREE ON EXTENSIONS

M. E. Sampsell, president of the Seattle-Renton Railway, operating in Seattle, Wash., after a recent conference with the City Council of that city, agreed to begin the Genesee Street extension of the Rainier Avenue line as soon as possible. This promise was made in consideration of concessions relative to paving between rails of the line. According to the terms of the franchise of the company, the Genesee line must be completed within a year from last June, when court proceedings over the Seattle, Renton & Southern Railway ceased. The Genesee line will be single track. The company will not have to pave east of Forty-seventh Street. The City Council granted practically every concession asked by the railway. According to present plans the company will proceed with an early expenditure of approximately \$150,000, making it possible, when the work is completed, to reduce the running time from Renton to the Seattle terminus by ten minutes. Mr. Sampsell made it plain to city officials that his company desires to work harmoniously with the city. Mr. Sampsell has been negotiating with the city for common user rights on Fourth Avenue for cars on the Seattle Municipal Railway.

UNION RESTRAINED IN MISSOURI STRIKE

The original restraining order in connection with the strike of the employees of the Springfield (Mo.) Traction Company, noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 7, page 741, preventing the union from striking was dismissed by Judge Woodrough. His opinion was that the company should arbitrate, not because an employee had been unjustly discharged, but for the satisfaction of the remaining members of the union. The company immediately offered to arbitrate. The union, however, refused arbitration and demanded the immediate reinstatement of the discharged employee with pay from the date of discharge. The company refused this demand and the union employees struck. Judge Pollock then granted a temporary restraining order against the union and the union sympathizers from interference with the operation of the traction company. This temporary writ of restraint was returnable on Oct. 20 before Judge Van Valkenburg, who rendered an opinion on Oct. 23 granting the traction company a temporary injunction against interference by the union or union sympathizers. The company is now operating 75 per cent of the regular number of cars, with service on all but two minor lines.

ANOTHER PLEA FOR LENIENCY

Donald C. Barnes, manager of the Everett Railway, Light & Power Company, Everett, Wash., in a letter written to petitioners for an extension of the Summit Avenue line of the company, said in part:

"We have your petition for the extension of our lines on Summit Avenue, and take this opportunity to present to you our position in this matter. The street railway business in this city has never been profitable, and unless the company receives some relief from its franchise obligations, such as the rescinding of free transfers, paving requirements, etc., or freedom from unregulated jitney competition, the present business cannot be continued. The results of operation of last year were: gross earnings, \$97,948; operating expenses, \$94,384; balance, \$3,563; taxes, \$12,837; deficit, \$9,937. In other words, the revenue was not sufficient to pay operating expenses and taxes, with no provision for interest and the sinking fund.

"It is impossible to raise further funds for extensions until the money already invested can be made to show some returns. The city now has an ordinance which levies an annual license tax of \$400 on peddlers with motor vehicles. This was passed to protect the merchants who have established business here and are entitled to this protection. The case of the jitney operator is analogous. He is a peddler who, paying only a nominal tax and incurring no obligations of service, comes in to-day, skims the cream of an established business, and is gone to-morrow. He runs his vehicle only on the streets which the street railway has helped to pave, and duplicates the service already provided. The time is soon coming when the public must choose between the two, and the only way you can secure extensions and an adequate system of transportation is by directing your efforts to the elimination of jitney competition."

COMMISSION UPHeld IN IMPROVEMENT CASE

The Public Service Commission for the First District of New York has recently been upheld by unanimous decision of the Court of Appeals as to its powers to direct public service corporations to undertake "reasonable improvements." This decision reverses a unanimous decision of the Appellate Division, First Department, which annulled an order of the commission made on March 19, 1915, directing the New York & Queens Gas Company to extend its mains and supply service from Bayside, Queens, to Douglaston and Douglaston Manor, sections without illuminating gas. Judge Cuddeback, writing the opinion of the Court of Appeals, holds that the courts have no right to exercise administrative powers such as those possessed by the Public Service Commission. The commission directed the extension of the gas mains after several hearings. The gas company appealed. It contended that the cost would be greater than any financial return possible in the succeeding few years warranted. The Appellate Division upheld this view, and describing the order of the commission as unreasonable,

annulled it. The Court of Appeals, however, has decided that the order of the commission was reasonable and should stand. Counsel for the commission contended in the latter tribunal that the lower court had assumed to itself powers and duties belonging to the commission. This view the court took, Judge Cuddeback holding that the Appellate Division had the power only to determine that the commission's order was unreasonable in that it was "an unlawful, arbitrary or capricious exercise of power." He held further that if the decision of the Appellate Division were allowed to stand it would "go far toward defeating the efforts of the Legislature to establish agencies to regulate the great public service corporations."

NEW WORKING AGREEMENT IN CHATTANOOGA

Brief Review Is Presented of Negotiations Leading Up to Settlement Arranged on Oct. 7 for a Year and a Half

The Chattanooga Railway & Light Company, Chattanooga, Tenn., has made a new working agreement with its employees, dated Oct. 7, to be effective for a year and a half. The agreement is on the open shop basis. It is the outcome of negotiations in progress since last August and differs materially in several respects from the conditions of the working agreement incorrectly reported in the issue of this paper for Sept. 9. A brief review of the labor situation in Chattanooga follows:

The Chattanooga Railway & Light Company has always operated on the open shop principle. Early in August representatives of the Amalgamated Association attempted to unionize the property and force a closed shop. The company had, of its own accord, increased the wages of the platform men effective on Aug. 1, and most of the men were satisfied with the wage schedules and working conditions. The Amalgamated representatives did not meet with much success. With the assistance of local unions, principally the machinists' union, however, they commenced to intimidate the platform men in an endeavor to force them from the cars or join the union. On the evening of Aug. 21 a mob of several hundred union men and sympathizers commenced pulling them from the platforms of the cars in the down-town districts. Considerable disorder followed and the Commissioner of Police put in a riot call and called out the fire department to clear the streets. The trouble resulted in a walk-out, and it was late that night before all the cars could be put back in the carhouses.

The day following, negotiations were opened through the Mayor of the city and a conference was held between the local labor union and officials of the company. At that time the men agreed to return to work, and the company agreed to recognize the men as heretofore on the open shop basis and drew up a new working agreement. Service was resumed and has continued uninterruptedly ever since that date. About Oct. 1, however, the officers of the Amalgamated Association again appeared upon the scene and insisted upon a closed shop agreement. This was declined by the company and it looked for a time as if there would be more trouble. The majority of the platform men, however, satisfied with their working conditions and the wage schedule, which had just been increased, refused to call a strike and the Amalgamated officers left the city.

On Oct. 7 the company made a new working agreement with its employees to be effective for one year and a half. This agreement is on the open shop basis, the company agreeing merely not to discriminate against those of its employees who are members of the union.

The wage scale remains the same as fixed on Aug. 1, prior to the walkout. It is as follows: first six months, 18 cents an hour; second six months, 20 cents an hour; second year, 22 cents an hour; third year, 23 cents an hour; fourth year, 24 cents an hour; fifth year and over, 25 cents an hour.

The working agreement is for a period of one year and a half. Arbitration is provided for as a means of adjusting the question of wages only, which the company agrees to advance if the earnings warrant. The employees are to ask arbitration on this point if they cannot agree with the company, but once fixed, wages are to remain in force for one year thereafter. All other working conditions remain the same as they were bulletined and in effect prior to the date of making the new agreement.

BUFFALO LINES CO-OPERATE IN POWER MOVEMENT

The International Railway, Buffalo, N. Y., and the Niagara Junction Railway, Niagara Falls, N. Y., are co-operating in the movement for greater diversion of water from the Niagara River for power development. Maj. Harry Burgess, of the United States lake survey, who held a hearing recently on the necessity for greater power development, received formal statements from the two electric lines relative to the acute shortage of power. The Ontario Hydro-Electric Commission has stopped the exportation of one large block of energy to American consumers and threatens to stop all exportation by the Canadian-Niagara Power Company, Ltd. This would have a serious effect upon the two railways mentioned previously as well as upon other large users of Canadian power along the Niagara frontier. With the advent of the operation of the International Railway's new double-track fast line between Buffalo and Niagara Falls next summer the company will require additional current, and increased business on the Niagara Junction Railway has forced that company to seek additional power.

NEW EXPRESS TERMINAL FOR DALLAS

J. F. Strickland, president of the Texas Electric Railway, has purchased an entire block of ground bounded by Young, Jefferson, Market and Wood Streets, Dallas, Tex., near the new \$5,000,000 passenger terminal station of the steam railways for \$175,000, and will erect a commodious electric express terminal thereon. This new express terminal for all electric lines entering Dallas will be the largest terminal of its kind in the world, according to Burr Martin, general manager of the Texas Traction Company and the Southern Traction Company, and Louis Horner, president of the Electric Express Company. Messrs. Martin and Horner are now working out plans for the building and trackage facilities from the interurban lines on Jefferson Street.

TRAFFIC REPORT AT ROCHESTER

Bion J. Arnold, who has been acting as consulting engineer of the Chamber of Commerce of Rochester, N. Y., on the local railway situation, has just presented a report. He recommends (1) rerouteing, (2) improvements in operation to accelerate traffic, (3) more strict traffic regulations, (4) street widening and new bridges, (5) improvements in physical property and (6) track extensions. The improvements in operation recommended include double berth operation at downtown crossings, more rapid acceleration, substitution of near-side for far-side stops, increase in stop spacing and front-end exit. The improvements in physical property include alterations in car platform arrangement to facilitate loading, more destination signs and electrically operated track switches at certain points. The proposed extensions include a suggestion that the abandoned Erie Canal has possibilities for the use of a high-speed interurban entrance to the city.

Buffalo Tax Review Case.—The City Council of Buffalo, N. Y., has appropriated \$20,000 to be used by the law department in defending the action brought by the International Railway for a review of its special franchise assessment and has authorized the corporation counsel to spend up to \$50,000 to defend the case. The Council has failed to approve the corporation counsel's request for an additional \$5,000 with which to start an action against the International Railway to determine whether or not the rate of fare in Buffalo should be reduced from 5 cents to 4 cents.

Dynamite Exploded in New York Subway.—A charge of dynamite which injured two persons, tore up a rail, and blew a hole 18 in. deep in the cement bed of the track was set off at 4.37 a. m. on Oct. 25 at the southern end of the platform of the subway station at 110th Street and Lenox Avenue, New York. The police asserted that in their opinion the dynamite was set off by persons sympathizing with the strike of Interborough Rapid Transit Company employees, though they said they had no evidence to connect the crime with any individual. Of the two persons injured one was the ticket agent, who was cut by glass. The other was a negro who was descending the steps of the south end of the station.

Selection of Third Cleveland Arbitrator Up to Court.—The two members of the board of arbitration, selected to settle the dispute between the Cleveland Railway and the city of Cleveland over the power contract with the Cleveland Electric Illuminating Company, failed at their final meeting on Oct. 23 to agree upon a third member. The selection will be made by Federal Judge John M. Killits of Toledo. Engineer Joseph Alexander represents the company and Attorney T. L. Sidlo represents the city. Each of them had offered a score of names for consideration. The company suggested A. B. Du Pont among others. He represented the city in a former arbitration. Attorney Sidlo asked for more time, but finally agreed to place the matter in the hands of Judge Killits at once.

Plans Made for Restoring Service in Yonkers.—Frederick W. Whitridge, president of the Third Avenue Railway, New York, N. Y., and of its subsidiary, the Yonkers Railroad, notified Mayor James T. Lennon on Oct. 25 that he would operate cars in Yonkers on Oct. 26. When a similar attempt was made on Oct. 1 cars were wrecked. The cars were then withdrawn until now Yonkers has been without electric railway service for nearly nine weeks. Mayor Lennon, apparently having the earlier disorder in mind, issued a proclamation reviewing the obligations of the citizens and warning them of the dangers which attach to participation in disorder. It is understood that Mr. Whitridge has induced many of his old employees to return to work, and with these will be sent new crews to acquire the experience demanded by the fifteen-day ordinance.

Referendum Asked on Strike Prevention Plan.—The Chamber of Commerce of the United States, in accordance with instructions given by the Board of Directors, has been requested to submit to its constituent members, in the form of a referendum, the plan suggested by the Merchants' Association of New York for preventing the interruption of the operation of public utilities. The principle indorsed by the association is based upon the establishment of a contractual relation between employers and employees upon public utilities. Upon this basis a plan was worked out in detail by Henry R. Towne. The association accepted this plan, but expressed its willingness to give its approval to any other practical method of insuring the freedom of public utilities from interruption. Copies of the pamphlet containing the plan and the resolutions of the board of directors have been sent to all the commercial organizations of the United States. A digest of the plan was published in this paper for Sept. 30, page 692, in connection with the account of the strike in New York.

Additional Transit Facilities Urged for Brooklyn.—With a letter urging citizens of Brooklyn to support the proposals of the Public Service Commission for the First District of New York for the betterment of transit conditions in Brooklyn, the Committee of One Hundred has presented the commission's comprehensive program of rapid transit for all Brooklyn. The program suggests the construction of a Livingston-Clinton Street subway, with an Ashland Place connection, and the construction of many crosstown lines from Long Island Sound to the Atlantic Ocean, all at a cost of \$14,000,000. The Public Service Commission recommends negotiations with the Brooklyn Rapid Transit Company toward a fixation of a price at which the existing railroads may be taken over, and suggests that the matter of valuation be referred to a committee of ten, five to be appointed by the railway company and five by the Public Service Commission. In calling the attention of the citizens of Brooklyn to the proposals, the committee urges that the extra tax of 1 per cent a year on the value of real-estate holdings for a term of ten years will be more than repaid by the benefit to such real estate.

PROGRAM OF ASSOCIATION MEETING

Illinois Electric Railways Association

The next meeting of the Illinois Electric Railways Association will be held at the La Salle Hotel, Chicago, Ill., at 10 a. m. on Nov. 17. The program will be announced later. It is expected that the topics presented will include one-man cars, charges for baggage, the safety code, personal injury and damage claims and regulation by commissions.

Financial and Corporate

EARNINGS STATISTICS FOR JULY

Returns for 1916 and 1915 Indicate Lack of Improvement in West—Operating Expenses and Taxes Advance

A comparison of electric railway statistics for July, 1916, with figures for the corresponding month of 1915, made by the information bureau of the American Electric Railway Association, indicate some improvement in the electric railway business of the East and the South, together with a depression in the West, while there has been an advance in the operating expenses and taxes of all districts. Returns representing 7129 miles of line of companies scattered throughout the country show an increase in operating revenues of 5.54 per cent, in operating expenses of 5.49 per cent and in net earnings of 5.61 per cent, while returns representing 5826 miles of line show an increase in taxes of 9.61 per cent and in operating income of 5.13 per cent.

Of the three groups shown in the accompanying table the Eastern, represented by 4563 miles of line, or about 50 per cent of the total mileage, shows an increase in operating revenue of 7.92 per cent, in operating expenses of 7.68 per cent and in net earnings of 8.27 per cent. Returns representing 3724 miles of line show an increase in the amount of taxes paid of 11.28 per cent and in operating income of 6.84 per cent.

The Southern group, represented by 749 miles of line, had an increase of 5.70 per cent in operating revenues and net earnings, while operating expenses increased 5.69 per cent. Returns for about 65 per cent of this mileage indicate an increase in net income of 8.30 per cent.

The Western group alone shows no improvement. Returns from companies represented by 1817 miles of line

show a decrease in operating revenues of 1.05 per cent, almost no change in operating expenses and a decrease in net earnings of 2.78 per cent. Moreover, returns for about 87 per cent of this mileage show an increase in the amount of taxes paid of 6.65 per cent and a decrease in net income of 1.33 per cent.

There was almost no change in the operating ratio of all the districts, the operating ratio of the United States as a whole decreasing from 59.55 per cent in 1915 to 59.52 per cent in 1916.

ANNUAL REPORT

Boston Elevated Railway

The statement of income, profit and loss of the Boston (Mass.) Elevated Railway for the fiscal year ended June 30, 1916, follows:

Railway operating revenues.....	\$18,686,971
Operating expenses:	
Maintenance of way and structures.....	\$1,733,379
Maintenance of equipment.....	1,324,964
Power	1,233,259
Conducting transportation	5,928,095
Traffic	18,901
General and miscellaneous.....	1,841,396
Total	\$12,079,996
Net revenue—railway operations.....	\$6,606,975
Taxes assignable to railway operations.....	1,043,041
Operating income	\$5,563,934
Non-operating income.....	94,356
Gross income	\$5,658,290
Deductions from gross income:	
*Rent for leased roads.....	\$2,580,490
†Miscellaneous rents	730,505
Net loss on miscellaneous physical property.....	5,261
Interest on funded debt.....	1,064,624
Interest on unfunded debt.....	65,052
Amortization of discount on funded debt.....	3,755
Miscellaneous debits	4,328
Total	\$4,454,520
Net income	\$1,203,770
Dividends	1,193,970
Balance to surplus.....	\$9,800

*Includes rent of Tremont Street subway. †Rents of all other subways and tunnels.

During the last fiscal year the revenue passengers carried totaled 363,477,041, an increase over the previous year of 17,160,457 or 4.9 per cent. The gross operating revenues increased \$888,364 or 4.9 per cent, while the operating expenses rose \$792,013 or 7.0 per cent. The net revenue from railway operations, therefore, increased only \$96,351 or about 1.5 per cent. Every group in the operating expense division showed increases except power, the expenses for which fell off \$57,058 or 4.4 per cent. The other items increased as follows: Maintenance of way and structures, \$303,812 or 21.2 per cent.; maintenance of equipment, \$121,613 or 10.1 per cent.; conducting transportation, \$307,266 or 5.4 per cent; traffic, \$13,611 or more than 250 per cent, and general and miscellaneous, \$102,767 or 5.9 per cent.

The total charges against the income account for taxes, rent of leased roads, rent of subways and tunnels, interest on funded debt, interest on unfunded debt and miscellaneous items for the last year amounted to \$5,497,562, an increase over the previous year of \$223,214. The items which increased were as follows: Interest on funded debt, \$101,005; rent of leased roads, \$70,515; rent of subways and tunnels, \$89,696, and miscellaneous items, \$9,258. The interest on the unfunded debt was \$21,113 less than for the preceding year. The net income for the last year showed a decrease of \$120,449 or 9.0 per cent. The dividend payments were decreased from 5½ per cent to 5 per cent, and the balance to surplus declined from \$10,852 to \$9,800.

The revenue car miles run during the year totaled 58,572,308, and the revenue car hours 5,515,231. The total surface track on June 30, 1916, was 486.85 miles, and the total rapid transit track 36.85 miles, or together 523.70 miles. The company had on the above-named date 5946 stockholders, owning 238,794 shares. Of these 5271, owning 215,149 shares, were in Massachusetts.

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR JULY, 1916

	Companies Not Reporting Taxes		Companies Reporting Taxes	
	Amount	Per Cent Increase	Amount	Per Cent Increase
<i>United States*</i>				
Operating revenues.....	\$17,114,046	5.54	\$15,938,372	5.35
Operating expenses.....	10,187,289	5.49	9,465,371	5.04
Net earnings	6,926,757	5.61	6,473,001	5.82
Taxes .....	.....	.....	1,029,340	9.61
Operating income .....	.....	.....	5,443,661	5.13
Operating ratio, per cent:				
1915	59.55	...	59.56	...
1916	59.52	...	59.38	...
Miles of line represented..	7,129	...	5,826	...
<i>Eastern District*</i>				
Operating revenues.....	\$12,199,886	7.92	\$11,648,387	7.47
Operating expenses	7,080,538	7.68	6,780,488	7.47
Net earnings	5,119,348	8.27	4,867,899	7.47
Taxes .....	.....	.....	719,052	11.28
Operating income .....	.....	.....	4,148,847	6.84
Operating ratio, per cent:				
1915	58.17	...	58.21	...
1916	58.03	...	58.20	...
Miles of line represented.	4,563	...	3,724	...
<i>Southern District*</i>				
Operating revenues.....	\$841,815	5.70	\$549,704	5.04
Operating expenses	493,437	5.69	307,929	3.53
Net earnings	348,378	5.70	241,775	7.03
Taxes .....	.....	.....	43,359	1.61
Operating income .....	.....	.....	198,416	8.30
Operating ratio, per cent:				
1915	58.61	...	56.83	...
1916	58.62	...	56.01	...
Miles of line represented.	749	...	499	...
<i>Western District*</i>				
Operating revenues.....	\$4,072,345	d1.05	\$3,740,281	d0.69
Operating expenses.....	2,613,314	d0.05	2,376,954	d1.76
Net earnings	1,459,031	d3.78	1,363,327	0.14
Taxes .....	.....	.....	266,929	6.65
Operating income .....	.....	.....	1,096,398	d1.33
Operating ratio, per cent:				
1915	63.53	...	63.85	...
1916	64.17	...	63.55	...
Miles of line represented..	1,817	...	1,603	...

NOTE.—Letter *d* denotes a decrease.

*Groupings are as follows: *Eastern District*—East of the Mississippi River and north of the Ohio River, exclusive of Greater New York. *Southern District*—South of the Ohio River and east of the Mississippi River. *Western District*—West of the Mississippi River.

B. R. T. GROSS INCREASES

According to the report of the Brooklyn (N.Y.) Rapid Transit Company for the quarter ended Sept. 30, 1916, the gross operating revenues showed an increase of \$418,006 or 5.7 per cent over those of the corresponding period in 1915. The operating expenses, however, also increased \$313,430 or 8.1 per cent, so that the net revenue from operation rose only \$104,756 or 3.0 per cent. Taxes jumped materially, to the extent of \$107,848 or 24.9 per cent.; non-operating income showed a slight falling off, and, owing to new rapid transit lines being placed in operation, income deductions rose \$239,475 or 20.6 per cent. The net result of these factors was a decrease in surplus of \$246,573 or 12.4 per cent. The comparative statement for the third quarter in 1915 and 1916 follows:

	1916	1915
Gross operating revenue.....	\$7,719,324	\$7,301,318
Operating expenses.....	4,175,597	3,862,167
Net revenue from operation.....	\$3,543,727	\$3,439,151
Taxes.....	539,779	431,931
Operating income.....	\$3,003,948	\$3,007,220
Non-operating income.....	125,709	129,535
Gross income.....	\$3,129,657	\$3,136,755
Income deductions.....	1,401,837	1,162,362
Surplus.....	\$1,727,820	\$1,974,393

TAXES ASSESSED IN VIRGINIA

The total value of the tangible and physical property of electric railways in Virginia, as assessed by the State Corporation Commission for the year 1915, was \$8,891,358. The State property tax on this assessed value, the tax on money and the franchise tax amounted to \$65,901. The total State tax assessed against electric railways for 1914 was \$83,225, a decrease of \$17,324 in 1915, caused chiefly by the reduction of the rate from \$0.35 to \$0.10 on \$100 of value. The accompanying table shows the detailed tax figures for the various companies. The tax on money is omitted, the total for all companies being only \$1,255.

The total value of the tangible and physical properties of the canals and steam railroads in the State for 1915 was \$127,840,979, the total taxes thereon amounting to \$1,430,827, an increase of \$346,608 over 1914. The value of the property of light, heat, power, gas and water companies operating in the State was fixed at \$10,481,241, while the taxes thereon totaled \$37,608, a decrease of \$22,628 from 1914 owing to the reduction in the rate from 1 per cent to one-half of 1 per cent.

1915 Taxable Values of Virginia Electric Railways with Taxes Assessed Thereon, and the Franchise Tax Assessed on the Gross Transportation Receipts for Year Ended June 30, 1915.

Name of Company	Miles	Total Property Value	Tax on Property	Franchise Tax	Total Tax
Appalachian Fr. Co.	1.05	\$11,856	\$12	\$134	\$146
Blue Ridge Lt. & Pr. Co.	5.30	35,937	36	165	202
Bristol Trac. Co.	3.57	13,983	14	79	93
Charlottesville & Albemarle Ry.	3.53	125,985	126	474	600
Danville Tr. & Pr. Co.	6.35	167,420	167	1,479	1,685
Henrico & Chesterfield Ry.	2.50	3,750	3	.....	3
Lynchburg Tr. & Lt. Co.	14.74	455,635	455	2,677	3,132
Mill Mountain Incline Co.	0.37	13,950	14	45	60
Newport News & Hampton Ry., Gas & Elec. Co.	32.54	901,940	902	3,718	4,806
Norfolk City & Suburban Ry.	4.50	27,322	27	76	104
Norfolk & Ocean View Ry.	8.88	111,729	112	694	806
Norfolk Ry. & Lt. Co.	32.39	685,310	685	.....	685
Radford Wtr. & Pr. Co.	2.63	16,922	17	102	120
Richmond & Chesapeake Bay Ry.	14.72	304,085	305	624	941
Richmond & Henrico Ry.	.....	.....	.....	594	594
Richmond Ry. & Viaduct Co.	4.93	406,060	406	710	1,116
Richmond & Rappahannock River Ry.	25.44	158,031	158	573	731
Roanoke Ry. & Elec. Co.	24.57	515,352	515	3,567	4,082
Tazewell St. Ry.	1.97	7,410	7	103	116
Virginia Ry. & Pr. Co.	137.04	3,401,111	3,401	30,964	35,316
Washington & Old Dominion Ry.	69.99	932,977	933	4,769	5,702
Washington Utilities Co.	.....	.....	.....	.....	10
Washington-Virginia Ry.	38.39	593,808	594	4,201	4,841
Total	435.41	\$8,891,358	\$8,891	\$55,754	\$65,901

ANOTHER OHIO DEAL REPORTED

Reports from Cleveland printed in the daily papers say that a holding company is in formation to take over stocks of Cleveland, Southwestern & Columbus Railway, Lake Shore Electric Railway, Lorain Street Railway, Sandusky, Fremont & Southern Railway, Cleveland, Painesville & Eastern Railway, and Cleveland, Painesville & Ashtabula Railroad. The Cleveland, Southwestern & Columbus Railway is controlled by Mandlebaum interests of Cleveland, while the other lines are controlled by E. W. Moore and H. A. Everett. The lines in the proposed new consolidation operate 400 miles from Toledo to Ashtabula and south from Cleveland to Wooster and Bucyrus, with through service to Columbus by traffic arrangements with lines south from Bucyrus.

The resident correspondent of the ELECTRIC RAILWAY JOURNAL in Cleveland reported on Oct. 25 that officials of the Lake Shore Electric Railway, the Cleveland, Painesville & Eastern Railway and the Cleveland, Southwestern & Columbus Railway stated they know nothing of negotiations of Eastern capitalists for the control of these properties. One of the men interviewed stated distinctly that up to that time there had been no negotiations so far as he was aware.

BEST YEAR FOR CALIFORNIA UTILITIES

What is called the "banner year" for public utility business in California is described in advance sheets of the annual report of the State Railroad Commission. The total operating revenue of California public utilities, including the entire business of the interstate railroads, which has not been segregated by them, was \$384,617,734 for the year ended June 30, 1916. The operating expenses were \$249,303,932, leaving net operating revenue for the year of \$135,313,802. These figures do not reflect the very great increase in the earnings of the steam railroads during the fiscal year, for which the data are not yet completely available. Under regulation by the commission and notwithstanding general financial depression, the net operating revenues of California utilities were \$2,879,708 greater in 1915 than in 1913 and \$5,710,327 greater in 1915 than in 1914.

During the years 1913, 1914 and 1915, additions, betterments and new construction were made by the principal classes of California utilities as follows: Steam railroads, \$55,048,885; electric railroads, \$15,603,661; electric companies, \$56,381,721; gas companies, \$10,099,696; telephone companies, \$46,374,853; water companies, \$6,999,708; total, \$190,508,527. Much more than \$200,000,000 in cash has gone into the further development of California public utilities during the period of supervision and regulation by the commission.

Electric Bond & Share Company, New York, N. Y.—The Electric Bond & Share Company has declared an extra dividend of \$1,000,000 on its common stock, all of which will go to the General Electric Company, as owner of the \$6,000,000 of common stock outstanding. The directors have also authorized the issue of \$2,000,000 additional preferred stock and a like amount of new common. The preferred will be offered at par and accrued dividends to holders of preferred stock of record at the close of business on Oct. 31, in the proportion of one share of new stock for each three shares held. The entire issue has been underwritten by William P. Bonbright & Company. The new common stock will be subscribed and paid for upon delivery to the General Electric Company. With the increases in effect, the company will have outstanding \$8,000,000 of each class of stock.

Evanston (Ill.) Railway.—The Illinois Public Utility Commission has authorized the Evanston Railway to make a mortgage in favor of the Merchants' Loan & Trust Company, Chicago, Ill., as trustee to secure an issue of \$44,800 of first and general mortgage bonds.

Interborough Rapid Transit Company, New York, N. Y.—The Interborough Rapid Transit Company has sold \$12,229,000 of 5 per cent first and refunding mortgage bonds to a syndicate headed by Lee, Higginson & Com-

pany, Harris, Forbes & Company and Kissel, Kinnicutt & Company. The bankers have also taken an option on another block of the same size. The bonds will be offered at 98%. The same bankers headed other selling syndicates for this issue of Interborough Rapid Transit Company bonds, the proceeds of which go to the construction of the new subways. The Public Service Commission authorized a total amount of \$106,957,000 of the bonds, of which only \$12,229,000 will remain to be disposed of when the latest transactions are completed. The bonds are callable at 110 and interest on any interest date, in any amount for the sinking fund, or at the option of the company either as a whole or in blocks of not less than \$500,000.

Kentucky Traction & Terminal Company, Lexington, Ky.—John Skain and George K. Graves, both of Lexington, were added to the directorate of the Kentucky Traction & Terminal Company at the annual meeting recently held in that city. The other directors were re-elected.

Ottumwa Railway & Light Company, Ottumwa, Iowa.—Fox, Hoyt & Company, Milwaukee, Wis., are offering at 97½ and interest, to yield 5.40 per cent, a block of first and refunding mortgage 5 per cent gold bonds of the Ottumwa Railway & Light Company dated Jan. 1, 1906, and due Jan. 1, 1924. These bonds are part of an issue limited to \$1,500,000, of which \$1,063,000 is outstanding, \$73,000 has been retired through sinking fund and \$86,000 is held in escrow for improvements.

Public Service Corporation of New Jersey, Newark, N. J.—A gross increase of \$423,477 in total business for September, 1916, over September, 1915, an increase of 13.2 per cent, is shown by the financial statement just issued by the Public Service Corporation of New Jersey for September last. For the nine months ended Sept. 30, 1916, the gross increase in total business over the corresponding period in 1915 was \$3,630,253, representing an increase of 13.3 per cent. For the month of September, 1916, the balance available—after payment of operating expenses, fixed charges, sinking fund requirement, etc.—for amortization, dividends and surplus, was \$562,707, and the increase in surplus available for dividends over the corresponding month of 1915 was \$98,439. For the nine months ended Sept. 30, 1916, the balance available for amortization, dividends and surplus totaled \$3,927,314, while the increase in surplus available for dividends amounted to \$888,504.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—The Missouri Public Service Commission has signed the order permitting the St. Joseph Railway, Light, Heat & Power Company to create a new mortgage to secure first and refunding mortgage sinking fund 5 per cent thirty-year gold bonds, due 1946. The company was authorized to issue \$751,000 of the bonds immediately, \$326,000 being utilized to retire the bonds outstanding on its interurban railway property. The new bonds are secured by a first mortgage upon the electric railway running between St. Joseph and Savannah, and by a second mortgage upon the remainder of the property of the company, including the street railway system and electric light and power plant and a central heating station serving St. Joseph.

Syracuse & South Bay Electric Railroad, Syracuse, N. Y.—Plans have been perfected for the reorganization of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad. The plans provide that the present holders of first mortgage bonds of the Syracuse & South Bay road will receive a \$300 5 per cent mortgage bond and \$600 in new first preferred stock for each \$1000 bond held. In the Syracuse, Watertown & St. Lawrence River road arrangements present first mortgage bondholders will receive a \$200 5 per cent mortgage bond and \$475 of first preferred stock for each \$1000 held. Holders of other securities will receive an equal amount of second preferred stock for those held. Holders of present first preferred stock of the South Bay line will receive new common stock equal in value to 50 per cent of their old stock. Through this procedure the common stock of both roads will be eliminated. The present bond issue will be reduced from \$375,000 to \$205,000. In order to meet the current expenses and the cost of the receivership a \$50,000 first lien note issue is proposed.

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., quarterly, 1¼ per cent, preferred.
 Brazilian Traction, Light & Power Company, Ltd., Toronto, Ontario, quarterly, 1 per cent, ordinary.
 Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, preferred; monthly, one-half of 1 per cent, common.
 Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1¼ per cent, preferred B; quarterly, 1¼ per cent, common.
 Havana Electric Railway, Light & Power Company, Havana, Cuba, 3 per cent, common and preferred.
 Lehigh Valley Transit Company, Allentown, Pa., quarterly, 1¼ per cent, preferred.
 Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly, 1½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE (LA.) ELECTRIC COMPANY						
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income	
1m., Aug., '16	\$17,352	*\$8,528	\$8,824	\$3,528	\$5,296	
1 " " '15	15,284	*8,715	6,569	2,169	4,400	
12 " " '16	207,284	*104,233	103,051	37,623	65,428	
12 " " '15	183,355	*109,968	73,387	25,420	49,967	
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Aug., '16	\$15,933	*\$10,446	\$5,487	\$1,105	\$4,382	
1 " " '16	14,394	*9,070	5,324	1,107	4,217	
12 " " '16	120,329	*103,765	16,564	13,241	3,322	
12 " " '15	116,775	*99,084	17,691	13,602	4,089	
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Aug., '16	\$74,427	*\$29,465	\$44,962	\$28,654	\$16,308	
1 " " '15	55,999	*25,760	30,239	28,679	1,560	
12 " " '16	814,064	*339,132	474,932	344,091	130,841	
12 " " '15	701,435	*321,247	380,188	345,000	35,188	
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Aug., '16	\$149,870	*\$96,559	\$53,311	\$36,587	†\$18,724	
1 " " '15	147,944	*92,059	55,885	33,398	22,487	
12 " " '16	1,903,196	*1,181,133	722,063	430,362	†308,901	
12 " " '15	1,906,442	*1,114,880	791,562	400,741	390,821	
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Aug., '16	\$71,088	*\$39,148	\$31,940	\$9,059	\$22,881	
1 " " '15	55,065	*29,325	25,740	8,930	16,810	
12 " " '16	813,903	*428,527	385,375	106,249	279,126	
12 " " '15	670,497	*378,939	291,558	104,831	186,727	
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.						
1m., Aug., '16	\$203,228	*\$129,261	\$73,967	\$48,296	\$25,671	
1 " " '15	179,548	*120,996	58,552	48,550	10,002	
8 " " '16	1,657,124	*1,116,855	540,269	389,228	151,041	
8 " " '15	1,533,164	*1,016,899	516,265	394,811	121,454	
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						
1m., Aug., '16	\$168,724	*\$104,365	\$64,359	\$36,429	\$27,930	
1 " " '15	135,756	*89,610	46,146	35,915	10,231	
12 " " '16	1,935,343	*1,215,651	719,692	437,338	282,354	
12 " " '15	2,039,965	*1,216,817	823,148	432,926	390,222	
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.						
1m., Aug., '16	\$29,459	*\$16,327	\$13,132	\$5,241	\$7,891	
1 " " '15	25,511	*12,903	12,608	5,522	7,086	
12 " " '16	313,999	*175,833	138,166	65,042	73,124	
12 " " '15	264,104	*163,413	100,691	66,888	33,803	
JACKSONVILLE (FLA.) TRACTION COMPANY						
1m., Aug., '16	\$49,422	*\$34,769	\$14,653	\$15,408	†\$755	
1 " " '15	47,613	*35,436	12,177	14,601	†2,424	
12 " " '16	617,874	*419,744	198,130	180,890	17,240	
12 " " '15	629,754	*441,863	187,891	170,292	17,599	
NORTHERN TEXAS ELECTRIC COMPANY, FT. WORTH, TEX.						
1m., Aug., '16	\$155,378	*\$97,617	\$57,761	\$28,916	\$28,845	
1 " " '15	147,095	*89,337	57,728	27,631	30,097	
12 " " '16	1,844,384	*1,131,646	712,738	341,845	370,893	
12 " " '15	1,755,262	*1,039,550	715,712	327,835	387,877	
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.						
1m., Aug., '16	\$671,861	*\$421,667	\$250,194	\$184,963	\$65,231	
1 " " '15	606,229	*387,167	219,063	182,894	36,169	
12 " " '16	7,775,272	*4,988,526	2,786,746	2,204,547	582,199	
12 " " '15	7,763,789	*4,787,515	2,976,274	2,160,424	815,850	
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Aug., '16	\$69,891	*\$47,833	\$22,058	\$23,713	†\$1,655	
1 " " '15	65,767	*44,786	20,981	23,274	†2,293	
12 " " '16	795,821	*535,472	260,349	280,513	†20,164	
12 " " '15	801,161	*520,838	280,323	278,030	2,293	

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

FARE INCREASE IN MASSACHUSETTS

Six-cent Rate Approved for Major Portion of Massachusetts Northeastern Street Railway by Commission—
Honest Capitalization and Efficient Management Accredited to Road

On Oct. 14 the Massachusetts Public Service Commission approved the general establishment of a 6-cent fare unit by the Massachusetts Northeastern Street Railway, with exceptions in certain city districts traversed by the company's lines in competition with the Bay State Street Railway and in other urban centers where the sale of tickets at five for 25 cents is required by the board. The company operates 128.31 miles of single track, of which 82.44 miles are in Massachusetts and 45.87 miles in New Hampshire. The road was originally called the Haverhill & Southern New Hampshire Street Railway, and was used as the medium under which ten other street railways under common control and management were merged into one in 1913. All the common stock of the Massachusetts Northeastern Street Railway is held by the New Hampshire Electric Railways.

The outstanding capitalization on June 30, 1916, including short-term notes, was \$3,576,000. The total permanent investment was carried on the company's balance sheet at \$3,573,917, or about \$30,000 per mile of single track. The commission held that the present capitalization of the company in stock and bonds represents capital honestly and prudently invested in property, which (allowing for replacements) still exists. The capitalization per mile was found to be moderate.

The company has never been a paying property. With the exception of two lines, none of the companies included in the 1913 merger ever paid a dividend. The physical condition of both these roads was poor, and more than \$300,000 has been expended in their rehabilitation in recent years. Since the 1913 merger, the Massachusetts Northeastern Street Railway has paid no dividends whatever upon its common stock. In 1914 a 3 per cent dividend was declared upon the preferred stock, but no other payments have been made. The surplus over fixed charges in the last fiscal year amounted to less than 6 per cent upon the preferred stock, eliminating the common stock, and it was even less in the two previous years. Only \$3,329 was set aside for depreciation in 1916, or one-half of 1 per cent on the cost of the equipment.

The commission found the property to be well managed, with every effort being made properly to allocate general expenses between the various utilities affiliated with the road, which include properties in New Hampshire and Maine. The railway pays 1.4 cents per kilowatt-hour, and operates and maintains its substations, assuming all transforming losses. Including the latter, the price of power for 1915 was about 1.75 cents per kilowatt-hour. The commission looked upon this cost as relatively high, although it recognized that interest and depreciation charges on a generating station and transmission lines were saved. The resulting cost per car-mile is high on the Massachusetts Northeastern Street Railway, being 6.19 cents in 1915 and 6.36 cents in 1916. The commission, however, was unable to say that the company could secure its power upon more advantageous terms in any other way. The character of the system and of its business is not favorable to low-cost power, the summer peak loads at week-ends and holidays being far beyond the normal peaks throughout the year.

The cars are operated with a reasonable measure of efficiency. The schedule speed in 1914 was 11.55 m.p.h., only two other large systems in the state providing faster service. In recent years the running time has been reduced upon several routes. The cars are in general in good repair and well painted. While much of the equipment is of a type that would hardly be selected at present, few of the

cars are fifteen or more years of age, and the management has recently ordered a number of more modern semi-convertible cars. The trucks are in general of a standard type. Barns, shops and storerooms appear to be in good condition and well handled. Salaries are moderate, and general and miscellaneous expenses comparatively low. In 1915 these expenses amounted to 9.73 per cent of operating revenue, compared with an average of 10.73 per cent for all the railways of the State.

Maintenance expenditures for the last ten years amounted to 20.71 per cent of operating revenue. The commission commended the management for sacrificing dividends in favor of a liberal maintenance policy. It pointed out that there are important items which will be subject to replacement later, viz.: cars, rails, buildings and power apparatus. The company has set aside no fund for the renewal of these items, barring the wholly inadequate provision for rolling stock depreciation which it has set aside in the last two years. Such a provision should be made and the public should meet its requirements. In general, it was held that the company is not earning a reasonable return upon the capital honestly and prudently invested in its system.

On the assumption that the new rates would yield 15 per cent additional revenue, the total increase in earnings would amount to about \$115,000 on the 1916 traffic basis. In view of the experience with similar increases in fares upon other Massachusetts street railways, this estimate is probably high. If additional revenue of that amount had been secured in 1916, the net income would have been sufficient for the payment of dividends of 6 per cent upon the common and preferred stock, leaving about \$25,000 for depreciation and the retirement of floating debt, an amount said to be certainly not excessive and probably inadequate. Moreover, a company which has for so long a time gone without dividend payments, and has, by this sacrifice, maintained its property in good operating condition, has an excellent claim to a return upon its common stock materially higher than 6 per cent.

The zones on the Massachusetts Northeastern are comparatively long. Excluding the beach sections, where only summer service is given, the average length of the fare sections on all divisions is 4.04 miles, which, on the basis of a 6-cent fare, is at the rate of 1.48 cents per mile. The length of the present zones radiating from Haverhill and Lawrence ranges from 3.75 to 5.94 miles. In view of the length of these zones and the character of the system as a whole, the commission did not feel that the company can fairly be required to retain the 5-cent fare throughout the entire distance, in each instance, except so far as the necessity of meeting the competition of the shorter Bay State line between Haverhill and Lawrence makes it to its own business interest to do so. The commission was of the opinion that the company, by the sale of five tickets for 25 cents, should maintain a 5-cent rate upon such portions of the zones in question as are within a distance of about 3.5 miles from the centers of the respective cities, local conditions to determine the exact distance. With the establishment of the 6-cent fare, school tickets will be sold at 3 cents instead of 2.5 cents each and all other existing reduced-fare tickets will be advanced 20 per cent in price. The case may be reopened after a year.

STANDARDS OF SERVICE ADOPTED FOR WASHINGTON

The Public Utilities Commission of the District of Columbia has adopted the regulations regarding standards of electric railway service in the district effective on Nov. 1. These standards are substantially the same as the tentative ones reviewed in the *ELECTRIC RAILWAY JOURNAL* of Sept. 2, page 419.

In its review of the matter the commission says that having in mind the possible adoption of standards of service studies were made of the application of the principles involved to the service and a public hearing was held on Oct. 26, 1914. After additional studies a second public hearing was held on June 19, 1916. Further studies were then made and conferences were held with representatives of the electric railways. A complete draft of the order was

finally made and furnished to all those interested. Another hearing was held on Sept. 6, 1916.

The commission says that in determining what standards should be applied it has refrained from changing materially the service which is being furnished on the average by the electric railways in the district. It says that a close relation naturally exists between the service and the price paid for the service. In this connection it calls attention to the valuation now being made of the electric railways in the district, and says that when the valuation has been completed "the commission will be in a position to determine what is fair and adequate service and what are fair and reasonable rates therefor."

At the hearings the Washington Railway & Electric Company took the position that there is no authority in the Public Utilities Act for adopting any measurement or standard of electric railway service; that the establishment of such a standard involves the question of rate of fare; that there are no complaints of the existing service; that standards would interfere with interstate traffic; and that the commission has no authority to require the electric railways to make observations of traffic or to require the procedure outlined in connection with the commission's non-compliance notice. In this connection the commission says that changes have been made in the original draft relative to making observations of traffic in order to remove "legally technical objections." It expresses the belief that with these changes made the objections of the company to the regulations are without foundation.

The Capital Traction Company suggested that the commission go no farther than the establishment of a rush standard at present, and that this standard receive a trial for a definite period of time before adoption. It argued that the order should exempt traffic covering periods of unusual demand such as baseball games, the inaugural exercises, etc.

The commission expresses the opinion that there is no danger to the electric railways from the formal adoption of the standards, and says that it was found that the regulations standardize rather than increase the service now being furnished. It says that to include in the regulations a general clause exempting from the operation of the standards the special classes of traffic referred to would practically nullify the effect of the whole order.

On Oct. 7 the Washington Railway & Electric Company filed with the Public Utilities Commission a letter asking reconsideration of the order recently adopted by the commission establishing standards for service in the district. Seven specific objections are filed by the company. The two most prominent are that the order involves a rate question and that the commission heretofore has refused to consider rate questions pending completion of the valuation, and that the company is engaged largely in interstate business, which would make compliance with the order difficult, since it applies only to the district.

RIGHT OF CITY TO REGULATE JITNEYS SUSTAINED

The contention of the city of Dallas, Tex., that jitneys operating on the streets of Dallas are subject to police regulation, is upheld in the decision of the State Supreme Court in the case styled *C. C. Booth et al. vs. the city of Dallas*, injunction, known as the "Dallas Jitney Case," which had gone to the State Supreme Court on application for writ of error. The highest state court refused the application for a writ of error, thereby sustaining the decision of the lower court in which the right of the city to regulate jitneys was acknowledged.

In the trial court, in which the Jitney Drivers' Union of Dallas sought to secure an injunction restraining the city of Dallas from interfering with the free and untrammelled operation of jitney buses over the streets of the city, three district judges sitting en banc refused the injunction. The case was appealed to the Court of Civil Appeals where the decision of the district court was upheld. The case was then carried to the Supreme Court on application for a writ of error and the decision of the district court was again upheld.

The Dallas jitney case is one of two cases involving the right of a city to regulate jitneys to reach the Supreme Court, and in each case the decision of the court has been favorable to the cities seeking to regulate jitney traffic.

EIGHT-CENT FARE UNIT AUTHORIZED

Decision of New Hampshire Commission in Manchester & Derry Street Railway Case Makes Company Just Self-Supporting

The establishment of an 8-cent fare unit in place of the existing 5-cent unit on the Manchester & Derry Street Railway was recently authorized by the New Hampshire Public Service Commission. The cars, in operating from Derry to Manchester, run over the company's own lines, a distance of 8.03 miles to the tracks of the Manchester & Nashua Street Railway, thence to Goffs Falls, and over the tracks of the Manchester Street Railway to Manchester, a distance of 4.451 miles. The fare has hitherto been 5 cents for each zone, viz., Manchester to Goffs Falls, Goffs Falls to Londonderry and Londonderry to Derry. The company desired to increase the two fares on the Derry road to 8 cents each. The former fare from any point in Manchester to Londonderry was 10 cents, and the fare to Derry 15 cents from Manchester. These it was proposed to increase to 13 and 21 cents, respectively.

The road began operation about eight years ago. Its capital stock is \$175,000; bonded indebtedness, \$125,000, and notes, \$51,000. The notes were in part used to meet the deficit from operations, which in the eight years amounted to \$43,008. The condition of the company does not seem to be improving, as the deficit for the nine months ended March 31, 1916, was \$6,001, without any depreciation allowance. At least \$300,000 was expended on the property. The cost was not abnormal, the decision stated, and there is no evidence or indication of any bad judgment or extravagance in construction, except as it may have been an error of judgment to build the road at all. The commission held that those who had invested their money in good faith in a public service enterprise where the demand for the service was insufficient at any reasonable price to yield a normal return upon the investment could not expect such a return, but the investors ought not to be compelled to continue to render the service at a loss. On the face of the figures the company was paying for the privilege of serving the public.

A careful scrutiny of the company's operating expense failed to disclose any item in which substantial reduction could be effected. On the other hand, it appeared that operating expenses should be increased by larger expenditures for maintenance, and the failure to maintain a depreciation reserve made more pressing the need for such a reserve in the future. Up to the present the company had been free from taxation, but beginning with 1918 it would inevitably have to meet a substantial annual charge for taxes. The company obviously needed more money, the decision stated, and it could be obtained only through increase of rates.

The proposed schedule, based on the traffic for the fiscal year 1915, would produce increased revenue of \$17,050, assuming that no diminution in patronage followed the increase in rates. Such an assumption, however, was said to be unsafe. To take care of the annual deficit and necessary increased provision for maintenance would require more than \$8,000. An annual depreciation reserve of about \$5,000 could not be deemed excessive. This would leave \$4,000 to \$5,000 to be applied in reduction of the accrued deficit until such time as the property would come in for taxation, when the whole balance, if not more, would probably be required for that purpose. The proposed rate, therefore, might make the company self-supporting, but it could hardly do more. It offers no substantial hope of any return whatever on the investment in the near future, if at all.

In such a situation, the commission held, it does not see how it could justify a refusal of the rate increase. The road is in active competition with the Boston & Maine Railroad, and its fares cannot be judged by the standard of an urban street railway having a monopoly. It occupies, in this respect, a position intermediate between the street railway and the steam railroad. The proposed fare of 16 cents, computed on the total length of its line, amounts to 1.99 cents per mile. Including the fare of 5 cents on the Manchester city road, the total proposed fare from Manchester to Derry becomes 21 cents. On the Boston & Maine Railroad the fare is 28 cents from Manchester to

Derry, or by mileage, 27 cents. The commission said that the rates on an interurban road must be expected to be lower than by steam railroad, because the service, though more frequent, is notably inferior in speed, and that they must also be expected to be higher than on a purely urban street railway, on account of the lower density of traffic and longer ride. The only question is whether the relative proportion which the proposed rates bear to normal street railway rates on the one hand and to railroad rates on the other is so manifestly irrational that they cannot be permitted, regardless of the company's financial condition. No such disproportion in the present case could be found. The commission therefore authorized the 8-cent rate to go into effect on Oct. 1.

Safety-First Exhibit in Louisville.—In connection with a safety-first exhibit which the Boy Scouts organization at Louisville, Ky., is planning, the Louisville Railway and the Louisville & Southern Indiana Traction Company have loaned to the Scouts placards which the companies are using in their cars. These will be displayed in groups and the scout master in charge will explain the purposes of the placards to those who stop at his booth.

Tulsa Jitneys Under Restraint.—Jitney buses in Tulsa, Okla., were forced out of business by a city ordinance that went into effect on Oct. 19. This ordinance requires heavy indemnity bonds from the jitneys and regulates the routes, forcing them to streets on which the street railway has no tracks. Considerable inconvenience was experienced for several days, as the Tulsa Traction Company was not fully prepared to handle the additional traffic that was suddenly thrown on it. This situation was quickly adjusted.

Near Side Stops in Portland, Ore.—On Oct. 1, cars of the Portland Railway, Light & Power Company, Portland, Ore., began stopping on the near side of street intersections on paved streets, instead of on the far side, as in the past. The change is included in the new city traffic ordinance and will be applied by the street railway company, in spite of the fact that enforcement of the traffic ordinance has been suspended by the city temporarily. The street cars carried placards announcing the new method, and carmen were instructed to use discretion in assisting the public to become accustomed to the change.

Fall Service Advertised Again at Louisville.—The Louisville & Northern Railway & Lighting Company and the Louisville & Southern Indiana Traction Company are consistently using printers' ink in encouraging travel. At this time of the year the advertisements extoll the beauties of the autumn foliage on Silver Hills and along Silver Creek, near New Albany, Ind. It is suggested day after day that patrons of the company can ride over from Louisville, go to the woods and gather the bright-hued leaves. The advertisements are inserted on the amusement advertising scale, which entitles the advertiser to reading notices elsewhere.

Parlor-Café Cars for Texas Road.—The Texas Electric Railway, Dallas, Tex., will inaugurate interurban parlor-café cars about Jan. 1, 1917, on its lines between Denison and Corsicana and Waco. Announcement to this effect has been made by Burr Martin, general manager of the Southern Traction Company and the Texas Traction Company. The parlor-café cars will be attached as trailers to the regular interurban trains as now operated. Six new passenger cars, acquired by the Strickland interests when they purchased the Dallas-Waxahachie interurban from Stone & Webster in 1912, will be converted into parlor-café cars, the work being done in the Strickland shops at Monroe, south of Oak Cliff.

Advertising Campaign Against Jitneys.—The Dallas (Tex.) street railways are seizing on opportune themes for their advertisements in their campaign for business against the jitneys. An advertisement that appeared in the daily newspapers during the Texas State Fair at Dallas, Oct. 14-29, addressed to "Fair Visitors," said "Why take chances of being robbed or assaulted by thugs or bandits, Ride the street cars. The safe way. Dallas Electric Railways, E. T. Moore, manager." The appeal in this ad was based on the fact that there had been numerous robberies and holdups by persons pretending to operate jitneys. Getting their intended victims in their car, they would drive to some lonely place and there assault and rob them.

Change in Traffic Regulations at Toledo, Ohio.—A special committee of the City Council at Toledo, Ohio, submitted a report to the committee on railways and telegraphs on Oct. 18 which, it is believed, will result in an improvement in the street railway service. At several of the stops in the busiest districts provision is made for loading two cars at a time, and it is recommended that chains be placed about the safety strip, so that vehicular traffic may be continuous. At other points it is recommended that the cars cross the street before loading and unloading, that two cars be loaded at the same time and that chains be placed about the safety strips. At a few other points the committee advises that vehicles be stopped when street cars are in the process of loading or unloading.

San Francisco Considers Bus Line Auxiliary Service.—In a recent report to the Board of Supervisors, M. M. O'Shaughnessy, city engineer of San Francisco, Cal., suggested that further study be made of the feasibility of putting in operation an auto bus line to extend the service of the Municipal Railway System into the Hunters Point district. The bus line route would be from the present terminal of the Potrero Avenue branch, which is about 3 miles distant from the industrial center at Hunters Point. The idea is not that the line would be profitable at first, but that if it is decided to meet the service needs of this district, the service could be supplied at least cost by auto buses. A branch of the municipal line could be built later if sufficient traffic developed to warrant the construction of the line.

Through Service Connection Ordered at Boston.—The Public Service Commission of Massachusetts has issued an order requiring the Boston Elevated Railway and the Bay State Street Railway to install a track connection in Arlington, to provide for the operation of through cars between Winchester and Harvard Square, Cambridge. The Bay State Street Railway operates cars at present from Winchester to Arlington Center and the remainder of the trip to Harvard Square is made in cars of the Boston Elevated Railway. It is urged that the installation of through service will shorten the running time between Boston and Winchester and give residents of the latter municipality the advantages of a through connection with Cambridge subway trains, which will shortly be operated through Summer Street, Boston, to the South Station.

Another New Jersey Line Seeks to Increase Its Fare.—The Bucks County Interurban Railway, Trenton, N. J., has applied to the Public Utility Commission of New Jersey and the Public Service Commission of Pennsylvania for permission to put into effect a new schedule of rates, providing for several increases in fares. The company desires the new schedule to become effective on Nov. 26. The proposed schedule provides for an advance of 5 cents in the fare between Trenton and Lambertville, bringing the total fare up to 30 cents. It also provides for an increase from 15 cents to 20 cents in the fare from Trenton to Newtown, Pa., and a 5-cent increase in the fare from Newtown to Bristol, Pa., and from Newtown to Doylestown. No advance is proposed in the fare between Trenton and Morrisville, Pa., between Trenton and Yardley, or between Yardley and Newtown.

Injunction Obtained in Rochester Fare Case.—The New York State Railways, operating the Rochester city lines, has obtained an injunction in the Supreme Court of Monroe County against the enforcement of certain sections of the amended Rochester city charter regulating and reducing rates of fare charged by the company. The company was recently ordered to reduce its fare from Rochester to Charlotte territory from 10 cents to 5 cents, but pending the final outcome of the court action a 10-cent fare is being charged. Passengers who pay the extra 5 cents receive a claim coupon which will be redeemed for cash at the company's offices if the rate reduction is sustained. The company maintains that the 5-cent fare zone ends at the city line and therefore has been charging an extra 5 cents between the Rochester city line and Charlotte, a distance of almost 4 miles. Charlotte is on the shore of Lake Ontario and there is heavy travel between the city of Rochester and Charlotte.

Personal Mention

A. W. Baker has assumed the position of new business manager for the Athens Railway Electric Company, Athens, Ga., to succeed W. P. Strobhar, resigned, who has gone to Ohio.

Maj. J. L. Schley, formerly executive officer of the Public Utilities Commission of the District of Columbia, having been detailed to the United States Engineer Office at New Orleans, La., the commission has appointed Walter C. Allen, formerly electrical engineer of the District of Columbia, as its executive secretary.

Alfred Craven, at present chief engineer of the Public Service Commission for the First District of New York, has been appointed consulting engineer of the commission, effective on Nov. 1. The position was created for the purpose and in recognition of Mr. Craven's valuable services to the city and to the commission. At the same time the commission designated Daniel L. Turner, who is now deputy engineer of subway construction, as acting chief engineer. Mr. Craven was appointed chief engineer of the commission on Oct. 1, 1911.

D. J. McGrath, for the last two years research assistant in the electrical engineering department of the Massachusetts Institute of Technology, has severed his connection with the Institute and joined the staff of the Boston (Mass.) Elevated Railway. Mr. McGrath has been made a special assistant to M. C. Brush, president of the company, in connection with the revenue inquiry now being conducted into the company's affairs by the legislative recess commission established for that purpose. Mr. McGrath is the author of a number of notable articles on electric railway economics, with special reference to fare problems, and before leaving the Institute was occupied with the preparation of a report summarizing the investigations of the department upon electric railway costs and revenues in the past two or three years. At the mid-year meeting of the American Electric Railway Association on Feb. 4, 1916, Mr. McGrath presented a notable paper dealing with the return on Massachusetts investments.

OBITUARY

William Ward Hincer, Chicago manager of the Albert & J. M. Anderson Manufacturing Company, and Mrs. Hincer, while driving from Chicago to the Jovian convention at Indianapolis, met with an accident near Shelby, Ind., on Oct. 18, in which their automobile was overturned, causing the death of both.

Harry H. Gribben, superintendent of the Oakland, Cal., factory of the Standard Underground Cable Company, died suddenly on Sept. 25 at his home in Oakland, aged fifty-six years. Mr. Gribben was a native of Pittsburgh, Pa., and lived there until 1899, when he moved to California to take charge of the factory which the Standard company had just then completed. Previous to this he was general foreman in the company's Pittsburgh factory. He had been in the employ of the company more than thirty years.

Fenwick E. Low died suddenly at Milwaukee recently at the age of forty-two. He was formerly superintendent of the St. Paul lines of the Twin City Rapid Transit Company and later division superintendent of the Chicago & Milwaukee Electric Railroad, now the Chicago, North Shore & Milwaukee Railroad. Mr. Low became associated with the Twin City Rapid Transit Company subsequent to his connection with the Pullman Car Company, as general agent at Minneapolis. He was chief clerk to the general manager of the Twin City company for a year before being assigned to the management of the St. Paul lines. He was very active during the building of the Selby tunnel in St. Paul in 1907, thereby endangering his health to the extent that early in 1908 he decided to retire from the company. After six months' rest he returned to railway work as manager of the Chatham, Essex & Lake Shore Railway in Canada. Later he entered the employ of the Chicago & Milwaukee Electric Railroad.

Construction News

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

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

FRANCHISES

Berwyn, Ill.—The Metropolitan West Side Elevated Railway has accepted the ordinance granting franchise rights in Berwyn.

Blue Island, Ill.—The Chicago & Interurban Traction Company has accepted a new ordinance recently passed by the City Council of Blue Island extending its rights in that city for a period of twenty years from the date of the passage of the ordinance.

Litchfield, Ill.—The Illinois Traction System has received permission from the City Council of Litchfield to reroute the tracks leading into the city from Mount Olive. The change will take the tracks over State Street from the city limits to Water Street, thus eliminating several sharp curves and a dangerous railroad crossing.

Springfield, Ill.—The Springfield Consolidated Railway has received a franchise from the Council of Springfield for the construction of a single-track line from the end of its line in East Capitol Avenue to Bergen Park.

Moundsville, W. Va.—The Wheeling Traction Company has applied to the City Council for a change in its franchise in Moundsville and proposes to construct an extension of its tracks.

TRACK AND ROADWAY

Mobile, Volanta & Pensacola Railroad, Volanta, Ala.—This company reports that it expects to place contracts during the next four weeks for 20 miles of rails. The company plans to build 40 miles of new track.

British Columbia Electric Railway Company, Ltd., Vancouver, B. C.—It is reported that the City Council of Vancouver will request the British Columbia Electric Railway to continue double-tracking its lines on Hastings Street from Renfrew Street to Boundary Road.

Sacramento Valley Electric Railroad, Dixon, Cal.—This company plans to construct an extension from Dixon to Woodland.

Tampa & Eastern Traction Company, Tampa, Fla.—Construction has been begun near Gary on this company's proposed line from Tampa to Lakeland, about 33 miles. F. W. Cole, Tampa, president. [July 1, '16.]

Chicago & Interurban Traction Company, Chicago, Ill.—In accordance with the new franchise accepted by the Chicago & Interurban Traction Company in Blue Island, reconstruction of the company's double-track lines will be carried out under a three-year program, with 91-lb. 7-in. T-rail on wooden ties set in concrete, with furnace-slag or crushed-stone foundation and granite-block paving. The tracks in Burr Oak Avenue and Western Avenue are to be reconstructed during the first year, the Calumet Grove line the second year and the Vincennes Avenue tracks the third year. The company will furnish on all of its poles on Western Avenue and on certain poles on Burr Oak Avenue and Vincennes Avenue brackets to carry lights to be furnished by the city, which is also permitted to use the poles for its police and fire-alarm wires.

Kewanee & Eastern Electric Railway, Kewanee, Ill.—This company has filed a permit with the Public Utilities Commission of Illinois to construct a 120-mile line from a point opposite Muscatine, Iowa, to Streator, Ill. C. G. Lampman, Cedar Rapids, is interested. [Sept. 9, '16.]

Illinois Traction System, Peoria, Ill.—This company is reconstructing its tracks on West Market Street, Bloomington. That portion of the extreme west end of the line which has not been used for a number of years will not be relaid. The company is also reballasting its tracks on

North Center Street, Bloomington, preparatory to the installation of a new pavement.

***Boone, Iowa.**—Plans are being made to construct a line from Woodward to Boone. The Boone Commercial Association is interested.

Tri-City Railway Company of Iowa, Davenport, Iowa.—This company is planning the installation of another curve at Twentieth Street and Third Avenue. The company is also double-tracking its line to the Watch Tower and is making improvements on the track on Forty-third Street and Seventeenth Street, Moline, Ill.

Des Moines (Iowa) City Railway.—Double-tracking the entire Clark Street line will be done next spring if the city is able to put through a plan to widen the streets from Twelfth and Center Streets to Thirteenth and Clark Streets. City Engineer Kastberg has been asked to estimate the damages and expense of the proposed improvement. The first part of the work is planned to be the filling of Center Street from Ninth to Twelfth Streets. At one point the fill would be 4 ft.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The plans of the Kansas City, Kaw Valley & Western Railway for entering Lawrence over the new bridge have been forwarded by a recent decision of the Supreme Court of Kansas, which allows plans for the bridge to proceed. A citizen had asked an injunction against the construction, on the ground that it would cost more than \$200,000, the limit which a county may spend on a bridge. The court declared that since the county would pay only \$200,000 of the cost, the remainder to be paid by the Santa Fé Railroad, the injunction could not stand. The railway is now entering Lawrence over a temporary bridge.

Cumberland & Manchester Railroad, Manchester, Ky.—Plans are being considered by this company for the construction of an extension from Manchester to Beattyville. M. E. S. Posey, Barbourville, chief engineer. [Aug. 12, '16.]

Great Northern Railroad, St. Paul, Minn.—Plans are being worked out by the Great Northern Railroad for the electrification of more than 300 miles of main line between Spokane and Seattle and other mountain divisions in the West. The Great Northern Railroad, through a subsidiary company, controls water rights on Lake Chelan, in Washington, and the present plans, it is said, include the raising of the level of Lake Chelan, near which the main power plant would be established. It is understood that actual preliminary work on the project will be started by next summer.

***Biloxi, Miss.**—Plans are being considered by the Biloxi Vegetable and Fruit Growers' Association for the construction of a line between Biloxi and Ocean Springs. Two propositions for a right-of-way are under consideration, one to traverse the ridge part of Back Bay and the other along the water front.

Kansas City (Mo.) Railways.—Work will be begun at once by this company on the construction of a line on Thirteenth Street from Minnesota Avenue to Central Avenue. A line will also be built on Eighteenth Street south from Central Avenue to Kansas Avenue, crossing the new Kansas Avenue Viaduct.

St. Joseph (Mo.) Electric Railway.—Extensive improvements to its system are being planned by the St. Joseph Electric Railway.

United Railways of St. Louis, St. Louis, Mo.—The annual report of the Director of Public Utilities, recently submitted, contains a plan to elevate the tracks of the Hodiadmont Street line of the United Railways from Vandeventer Avenue and Morgan Street to Hodiadmont and Maple Avenues. The plan provides for the construction of reinforced concrete walls for the elevated railway, with a 16-ft. clearance on each street. The cost is estimated at \$600,000. The Hodiadmont line east of Vandeventer Avenue would become an express line, with stops only at Grand Avenue, Garrison Avenue, Jefferson Avenue, Eighteenth Street and all streets east of Thirteenth Street. Plans for the building of a subway to connect with the elevated are contained in the report. The subway would be built under Morgan and Franklin Avenues, connecting with the elevated at Vandeventer Avenue. The extension of the Hodiadmont line

west on Maple Avenue to the Creve Coeur Lake tracks is suggested.

International Railway, Buffalo, N. Y.—The 70-mile gale which swept western New York Oct. 16 caused great damage on the Lockport & Olcott division of the International Railway, and no cars were operated over the line for almost thirty-six hours. Miles of poles were broken, wires were leveled and the Olcott sub-station was temporarily put out of commission. The Buffalo, Lockport & Rochester line was tied up for a short time during the worst of the gale.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Public Service Commission for the First District of New York until Nov. 9 for the construction of signal towers for parts of the Seventh Avenue-Lexington Avenue, White Plains Road and Queensboro Subway Rapid Transit Railroads. Further information may be obtained at the office of the commission, 120 Broadway.

Rochester (N. Y.) Connecting Railroad.—The Public Service Commission for the Second District of New York has denied the application of the Rochester Connecting Railway for a certificate of convenience and necessity and approval of the exercise of its rights and franchise. This proposed road was the complement of the proposed Niagara River & Eastern Railway to afford east and west outlets to the Buffalo, Lockport & Rochester Railway, and it was projected so that the three properties might eventually form a connecting link in a new transcontinental trunk line through the extension of the Canadian Northern Railway to the Niagara Gorge and the building of a new international bridge. The Rochester Connecting Railroad was to connect the eastern end of this system with the Pennsylvania and Erie Railroads at Rochester. The commission recently denied the application of the Niagara & Eastern Railway upon the ground that the rest of the project was still too indefinite.

Northern Ohio Electric Corporation, Akron, Ohio.—This company has been organized with a capital stock of \$6,375,000 to take over the property of the Northern Ohio Traction & Light Company.

Ardmore (Okla.) Railway.—It is reported that bids will be opened this month or early in November by the Ardmore Railway for the construction of its proposed line from Ardmore to the Fox oil fields. The route has not yet been definitely decided upon, but surveys are in progress.

***Hamilton, Ont.**—It is reported that the City Council of Hamilton and the Hydro Commission are considering the construction of an electric incline railway on Sherman Avenue at a cost of about \$200,000.

Toronto, Ont.—The Toronto Suburban Railway has received permission from the Ontario Railway Board to extend its tracks on Davenport Road easterly from Bathurst Street.

Toronto & York Radial Railway, Toronto, Ont.—At a recent joint meeting of the Ontario Railway and Municipal Board and the Dominion Railway Commission the application of the town of Aurora for interswitching facilities between the Grand Trunk Railway and the Toronto & York Radial Railway was granted. A switch 1100 yd. long will be constructed by the Toronto & York Radial Railway, providing for the hauling of freight cars from the Grand Trunk line to the factories located on the west side of the town.

Southern Oregon Traction Company, Medford, Ore.—Work will be begun at once by this company on the construction of three miles of track between Medford and Jacksonville.

Perkiomen Valley Traction Company, Collegeville, Pa.—The Public Service Commission of Pennsylvania has granted the Perkiomen Valley Traction Company a certificate of public convenience to construct its proposed line from Collegeville to Green Lane. James L. Wolcott, Dover, Del., president. [March 11, '16.]

Doylestown, Pa.—Speaking before the Borough Council of Doylestown, Louis A. Kellich, of Philadelphia, an engineer, announced that the proposed new trolley line from Doylestown to Perkasio would be constructed and that the line will eventually connect Doylestown with Harrisburg.

A committee has been appointed to aid in bringing about this new transportation link, for which a franchise has already been granted in Doylestown. [March 18, '16.]

Montgomery Transit Company, Norristown, Pa.—Plans are being made by this company to construct an extension to Souderton.

Ardmore & Llanerch Street Railway, Upper Darby, Pa.—This company has begun double-tracking its Ardmore branch from the end of its double-track line near Oakmont to County Line Road, Ardmore.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—A contract has been awarded by the Philadelphia & West Chester Traction Company to William J. Torrington, Philadelphia, for grading, masonry and roadway construction on its lines.

Womelsdorf, Richland & Myerstown Street Railway, Womelsdorf, Pa.—A bridge will be constructed by the Womelsdorf, Richland & Myerstown Street Railway over the Lebanon branch of the Philadelphia & Reading Railway. R. J. Lawrence, 525 East Gates Street, Philadelphia, engineer. [Sept. 30, '16.]

San Antonio, Gonzales & Houston Interurban Company, Houston, Tex.—A contract has been awarded by this company to J. H. Berryman & Company of Houston for the construction of the first 60 miles of its proposed line between Houston and San Antonio, and actual construction will soon be begun. At a recent meeting of the stockholders, Ed Kennedy, who promoted the road, retired as vice-president, and W. A. Reinhart, Houston, was elected to fill the vacancy. [Sept. 23, '16.]

Paris (Tex.) Transit Company.—This company has increased its capital stock from \$60,000 to \$80,000 and will improve and extend its street-railway system.

Salt Lake & Los Angeles Railway, Salt Lake City, Utah.—Plans are being made for the electrification of the Salt Lake & Los Angeles Railway and the construction of an extension to Garfield. Connections will be made with the Utah Light & Traction Company. A bond issue of \$300,000 to cover the cost will be floated at once and contracts let for both construction and power. The latter will be furnished by the Utah Power & Light Company.

SHOPS AND BUILDINGS

Tri-City Railway Company of Illinois, Rock Island, Ill.—Work has been begun by this company on the construction of a carhouse at Muscatine for both the city and interurban cars. The structure will be about 300 ft. long and about 60 ft. wide, of concrete or tile construction with a steel roof, and is to be so constructed that permanent additions can be made at any time. About half of the building will be fitted up as a machine shop. Clubrooms for street railway employees will also be provided for in the new structure.

Worcester (Mass.) Consolidated Street Railway.—This company plans to construct an addition to the carhouse of its valley division at North Uxbridge, which will double its capacity and add a large storage room for supplies at the rear of the structure. Plans have been drawn for the addition, which will be 20 ft. by 120 ft., one-story high, conforming to the architecture of the present carhouse. The new structure will extend back nearly 20 ft. beyond the present house and will give room for four extra tracks for storing cars. These new tracks will be built without the customary repair pits, as the barn is amply supplied with pits for this purpose. At the rear there will be a storage room for keeping sand, salt and other supplies. It will be fitted with a rear entrance so that teams can drive into the storehouse from the Elm Street side of the property.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Plans are being made by this company to construct a new station at University Place, Princeton.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to Louis Wechsler, New York City, for the construction of station finish for six stations on the new rapid transit lines. The contract price was \$382,521. Five of the stations are located on the new Seventh Avenue line. The sixth station under this contract is the Diagonal

Station at Forty-second Street, between Park and Lexington Avenues, near which the new Lexington Avenue line connects with the first subway. All work is to be completed within six months of the delivery of the contract, save for certain minor details.

Jefferson County Traction Company, Beaumont, Tex.—This company plans to construct a new brick station and make other improvements in Port Arthur.

Texas Electric Railway, Dallas, Tex.—The J. F. Strickland interests have purchased the block of ground bounded by Young, Jefferson, Wood and Market Streets, Dallas, and will construct thereon a new interurban express station. The tract lies one block east of the new union station of the railroads. Plans for the building have not yet been decided upon.

Tacoma (Wash.) Railway & Power Company.—The Tacoma Railway & Power Company is remodeling the Thirteenth Street corner of its carhouse to provide new quarters for the general offices of that company and the Puget Sound Electric Railway. In the new arrangement all the general offices will be on the first floor. The car finishing department, which formerly occupied that portion of the building, has been moved across the street to the first floor of the building in which the general offices are located. The men's recreation room in the basement at Thirteenth and A Streets has been moved to the Puyallup Avenue building, in which the freight offices are located. This building was recently remodeled at a cost of about \$4,500. The basement of the Thirteenth Street building will be used for a motor room and storage.

POWER HOUSES AND SUBSTATIONS

Centerville Light & Traction Company, Centerville, Iowa.—This company expects to erect a 33,000-volt, three-phase, 60-cycle transmission line from Centerville to Allerton, about 12 miles, after Jan. 1.

Bangor Railway & Electric Company, Bangor, Me.—A contract has been awarded to William E. Fish, Bangor, for the construction of this company's new substation at Corinth, and work will be begun at once.

Detroit (Mich.) United Railway.—This company is planning to modernize the boiler section of one of its two power plants in Detroit early in the coming spring. This is the plant, known locally as plant B, which contains steam turbines of a combined capacity of 10,500 kw. The changes contemplated are the substitution of six Stirling-type boilers for eight of the B. & W. type, the installation of forced-draft stokers and the building of a large brick stack. In providing further for the rapidly increasing demand for power it is proposed to contract with the Detroit Edison Company for from 3000 to 3500 kw. in addition to the present contract for 10,500 kw. This is in accordance with the policy of the company to purchase power wherever possible on its system in order to provide insurance against breakdown.

Morristown & Erie Railroad, Morristown, N. J.—In connection with the proposed electrification of its railroad from Morristown to Essex Fells, the Morristown & Erie Railroad Company will erect a substation in Morristown. Energy will be furnished by the Morris & Somerset Electric Company.

Bristol (Tenn.) Traction Company.—A contract has been awarded by the Bristol Traction Company to Robert Hutinson for the construction of a dam across the Holston River, near Big Creek. The power station at the dam will be equipped with three turbines capable of developing 1000 hp. The cost of the work is estimated at \$75,000.

Texas Traction Company, Dallas, Tex.—The power plant of the Denison-Sherman Interurban Company at Woodlake has been sold to the Stone & Webster Engineering Corporation and will be dismantled and shipped to Fort Worth. The Denison-Sherman Interurban is now a part of the Texas Traction Company and the power that operates the cars is generated in Fort Worth.

Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis.—This company plans to erect a substation adjacent to Little Lake Butte des Morts to supply additional energy in Neenah.

Manufactures and Supplies

VENTILATOR MANUFACTURERS REPORT ACTIVITY Several Large Orders Received—Difficulties of Street Car Ventilation—Purchasing on an Efficiency Basis— Need for Standardization

Several recent large orders for car ventilating equipment emphasize the statements made by ventilator manufacturers that business is steadily increasing. Last week the Chicago Surface Lines ordered 16,000 exhaust ventilators, and within the last few weeks the Public Service Railway Company ordered 800, and the Milwaukee Electric Railway & Light Company ordered 600. Definite attention has been actively directed to the car ventilation problem for only four or five years, but now the specification of exhaust ventilators for practically every car ordered and the sales of ventilators for installation on old monitor-deck cars point toward better days for the manufacturers of this type of car equipment.

A great deal of educational work has been necessary in order to bring the ventilator business to its present state. One of the noticeable features in this work has been the need for showing the railways that car ventilation was a real factor in good transportation service. The monitor-deck sash served its purpose for a great many years, but with the refinements in equipment and the use of the arch-roof car, the exhaust ventilator is now recognized to be an essential part of a car which has been designed to render full service to the public.

Experience in the design and installation of ventilators has proved that the street railway car offers a more difficult problem for the ventilation engineer than does the steam coach. This is largely due to the difference in service conditions. The differences lie in the frequent stops, rush-hour loads, and comparatively low speed of the street car as compared with the smaller loading, higher average speed, and fewer stops of the steam coach. The length of stopping time plays an important part in ventilator design, because when a car is standing and the wind is blowing at right angles to the track there is a tendency for the ventilators on one side of the car to act as intakes and those on the opposite side to act as exhausts, thus changing the operating conditions as compared with those when the car is moving and all ventilators are exhausting.

The first car ventilators of any kind were designed because of the need for changing the air in refrigerator cars. Next came the steam-coach ventilators and later the electric-car types. With the advent of the fully-enclosed car, the need for air intakes as well as exhaust ventilators presented itself. And now the development points toward an automatically-balanced or compensating system including intake and exhaust ventilators so designed that the intakes supply fresh air in an amount to balance that withdrawn by the exhaust ventilators. A compensating intake ventilator exhibited at the Atlantic City convention attracted considerable attention. This unit is designed for mounting on the car roof, and it is so arranged and adjusted that the amount of fresh air fed into the car is uniform at various speeds of the car and various wind pressures. The total amount admitted under any condition also is limited.

One of the selling problems of the ventilator manufacturer has been that of educating the electric railways to buy ventilation equipment on an efficiency basis. There has been a tendency until recently to install low-priced devices without definite regard for their mechanical efficiency in the removal of definite quantities of air. For a time it looked as though ventilating equipment was being bought on price rather than on quality of product. But the manufacturers have recommended and urged the sale of those devices which are known from broad experience to be the most efficient ventilators. Such devices cost more to manufacture and from the car-service standpoint are worth far more to the railroad than mere coverings for roof openings.

As a matter of fact, it was difficult at the start of the ventilator selling campaigns a few years ago to convince the mechanical officers of the roads how much it actually cost to manufacture a good ventilator. The master mechanic would say, "How do you people ever expect to justify a price like that on a sheet-metal box?" But whenever a road has attempted to build its own ventilators, justification for the manufacturers' price has been found in the high labor cost for shaping, forming and assembling ventilators. The prices for standard types of exhaust ventilators now range from \$3.50 to \$7.50, depending on the performance of the units. It is difficult to see how any reduction in these prices can reasonably be expected. However, one manufacturer points out that if the purchaser will agree he can manufacture ventilators more economically by using black sheet iron and spot welding it than by the present practice of using galvanized iron and riveting it. The black iron ventilators could be dipped in enamel and baked so that they would be rust-resisting.

Standardization of the ventilation openings also might make possible an economy in manufacture. As conditions now exist practically every ventilator order is a custom-made job. This is particularly true for the deck-sash ventilators. A standard size ventilator hole would enable the manufacturers to simplify their work, reduce the number of dies and make ventilators for stock. It is now the practice to specify ventilators by certain sizes, these sizes being the dimensions of the hole in the monitor deck or through the arch roof. If, through the American Electric Railway Engineering Association's committee on equipment and with the co-operation of the car builders, standard ventilator opening dimensions could be adopted and accepted by the operating companies, then the ventilator manufacturers would be in a position more economically to manufacture advance stocks and thus accelerate deliveries.

The tendencies in the ventilator trade are toward the acceptance of a combined system to include separate intake and exhaust units. The practice on many roads also points toward delivering the air below the breathing line after first having warmed it. The prospects for ventilator orders depend now very largely on the orders placed for new cars, but the general increase in business is also dependent on orders for ventilators to be installed on old equipment.

LABOR IN THE INDUSTRIAL FIELD

It Is Constantly Obtaining an Increased Share of the Profits of Manufacture

In these days of labor disputes in industrial undertakings it is of value to note that labor is constantly receiving an increased share of the profits of manufacturing. This statement, long maintained by economists, receives confirmation from statistics recently issued by the Census Bureau showing the situation in 1914 and in the three preceding five-year periods. A digest follows:

	Percentage of Increase		
	1904 over 1899	1909 over 1904	1914 over 1909
Capital employed	41.2	45.4	23.7
Primary horsepower	33.6	38.5	20.7
Wage earners, average number.....	16.0	21.0	6.4
Total wage payments.....	30.0	31.0	19.0
Value of products.....	29.7	39.7	17.3
Value added by manufacture.....	30.3	35.5	15.8

A careful inspection of this table shows, first, that the percentage of increase of capital in 1914 over 1909 is less than during either of the other periods, indicating that the profits were less. It also shows that the increase in the number of wage-earners was less than that of amount of capital, total wage payments or value added by manufacture. This indicates an increase in the proportion that capital contributes to the finished product as compared with the part contributed by labor, as well as a higher wage payment per employee. In other words, the wage-earners not only gain in wages but they have their manufacturing done for them at lower cost through the increasing use of capital. In a statement by The National City Bank of New York it is pointed out that if the wage-earner's position does not improve absolutely, the explanation must be found in the prices of materials and other things outside of the field in which labor and capital are the chief factors.

In 1899 the amount of capital employed in manufacturing was \$1,770 to each person employed, in 1904 it was \$2,117, in 1909 it was \$2,448 and in 1914 it was \$2,848. Every increase in the supply of capital makes an additional demand for labor, and with capital increasing faster than population, as it does, there is bound to be an upward tendency in wages. The 1916 figures would be interesting, if available.

BROOKLYN ORDERS COASTING RECORDERS

The New York Municipal Railway Corporation, which operates the extensive rapid transit lines built or building in Brooklyn and part of New York, has placed an order with the Railway Improvement Company for 300 type "H" coasting recorders, a number of Rico terminal clocks and other supplies. The present order will take care of all the New York Municipal cars now in service, but the railway has the option of ordering 600 additional recorders at the same price on or before June 1, 1917. In accordance with an agreement with the City of New York, the purchase of all equipment by the operators of the new rapid transit lines is subject to review by the Public Service Commission, First District. Following this procedure the commission has given its approval to the purchase of 900 coasting recorders by the New York Municipal Railway.

BEMIS CAR TRUCK COMPANY ACQUIRES ALL RIGHTS TO LORD BALTIMORE TRUCKS

A change of importance to the users of Lord Baltimore trucks is the acquirement from the Baltimore (Md.) Car Wheel Company by the Bemis Car Truck Company, Springfield, Mass., of all the former company's patent rights, good-will, patterns, etc., covering the manufacture and maintenance of Lord Baltimore trucks. The Bemis Company announces, through Warren L. Boyer, president, that it will soon be able to supply all orders for replacement parts of these trucks.

The purchase of the Lord Baltimore truck rights by this company is a logical expansion of its present business in the manufacture of case-hardened and manganese specialties for trucks of all kinds. Recently the company has added a fine-thread turnbuckle to its other products. The shops at Springfield have lately been equipped with additional machinery to help the company handle expeditiously its largely increased business.

ROLLING STOCK

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., is reported as considering the purchase of ten one-man cars.

Mobile, Volanta & Pensacola Railroad, Volanta, Ala., is in the market for one gasoline or gas-electric car seating not less than thirty passengers.

Towson & Cockeyville Electric Railway Company, Towson, Md., recently placed in operation an 18-ft. storage-battery car built by The J. G. Brill Company, Philadelphia.

United Railways & Electric Company, Md., noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 14, 1916, as being in the market for seventy-five double-truck, semi-convertible, four-motor, pay-within cars, has ordered this equipment from The J. G. Brill Company of Philadelphia, Pa.

TRADE NOTES

General Electric Company, Schenectady, N. Y., has received an order for seventy-five four-motor GE-200 equipments with type K control from the United Railways & Electric Co., Baltimore, Md.

Consolidated Car-Heating Company, Albany, N. Y., has received an order from the Boston Elevated Railway for 100 equipments of pneumatic door engines for the 100 new cars which this company recently ordered.

Westinghouse Air Brake Company and Westinghouse Traction Brake Company, Pittsburgh, Pa., have received an order for the straight air brake equipment to be used on the seventy-five cars of the United Railways & Electric Company of Baltimore, Md.

Holden & White, Chicago, Ill., general sales agents for the Garland Ventilator Company, have received an order

from The Milwaukee Electric Railway & Light Company for 600 Garland ventilators for fifty new cars.

The Grayson Railway Supply Company, St. Louis, Mo., will hereafter represent Holden & White, Chicago, Ill., in the sale of Perry anti-friction side bearings and Hartman centering center plates in Texas, Oklahoma, Arkansas, Louisiana and western Tennessee.

Nordberg Manufacturing Company, Milwaukee, Wis., builders of steam and electric hoists, Corliss engines, poppet valve engines, air compressors, oil engines and Nordberg-Carels Diesel engines, announce the appointment of H. W. Dow as sales manager. Mr. Dow has been associated with this company in the engineering and sales departments for twelve years.

G. A. White, formerly metallurgist of the American Sheet & Tin Plate Company, is now associated with the Titanium Alloy Manufacturing Company of Niagara Falls, N. Y., in the same capacity. Prior to his connection with the American Sheet & Tin Plate Company, Mr. White was for a considerable time with the Rock Island Railroad and also with the Eastern Steel Company, Pottsville, Pa., where he was engaged in the manufacture of structural material.

Roller-Smith Company, New York, N. Y., announces that it is now represented in Seattle, Wash., by C. K. Hillman, Pacific Block Building. Mr. Hillman will handle Roller-Smith instruments, circuit breakers and Columbia meters in Washington, Alaska, and parts of the States of Oregon and Idaho. This company has recently added Charles E. Kahant to its sales organization. Mr. Kahant will be connected with the main office at 233 Broadway, New York City. He has specialized in radio work for the past eight years and for the past four years had occupied the position of assistant manager of the Atlantic Communication Company, 90 West Street, New York, N. Y.

ADVERTISING LITERATURE

Chicago (Ill.) Varnish Company has issued a pamphlet on its "Ce Ve" process of steel car painting.

Spray Engineering Company, Boston, Mass., has issued an illustrated folder describing its new "Spraco" paint gun for all kinds of painting.

Electrose Manufacturing Company, Brooklyn N. Y., has issued its No. 14 bulletin describing and illustrating railway overhead, surface and underground line insulators.

Columbia Nut & Bolt Company, Bridgeport, Conn., has issued a pamphlet describing and illustrating its Columbia lock nut, and square and hexagon gib nuts.

Aberthaw Construction Company, Boston, Mass., has just issued a preliminary report on the "Effects of Vibration in Structures." In this report are incorporated a number of vibration records of buildings showing rates of vibration due to different disturbances. A unique device described is the vibration recorder, which is modeled on the principle of the seismograph originally developed from the study of earthquake phenomena.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just issued its publication No. 1574, describing and illustrating the maintenance of equipment in the Harvard shops of the Cleveland (Ohio) Railway Company, which were described in the *ELECTRIC RAILWAY JOURNAL* of Jan. 23, 1915, page 168 and Feb. 19, 1916, page 344. This seventy-five-page publication contains more than 100 halftones and is neatly bound in a four-color cover. In addition to covering the work done at the Harvard shops of the company, it includes an account of the work done at the operating stations, such as inspections, repairs, etc., including the washing and cleaning of cars. One of the most interesting sections is that devoted to shop practices. Both the old and new ways of removing trucks from car bodies, removing armatures from box or split-frame motors, cleaning motors after removal from trucks, and removing pinions, are illustrated and described. In addition, all of the practices of the armature room, such as blowing out, rewinding and soldering armatures, are given in detail. The latest up-to-date methods of repairing field coils, banding armatures, slotting commutators, and dipping and baking armature coils are also described. This is an excellent publication from the maintenance viewpoint and should be of great interest to master mechanics and maintenance men in general.