

# Electric Railway Journal

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## NEW YORK COMMISSION ON TRIAL

Events in connection with the investigation being conducted on the New York Public Service Commission, First District, have followed fast during the past week. As our issue of Dec. 11 went to press, the appointment of Oscar S. Straus as chairman of the commission was announced, and this week charges of a serious nature have been brought against another member of the commission. Until the accused has had a chance to answer them, it would be unfair to pass judgment, but if the charges are sustained the setback to commission regulation will be severe. The event certainly illustrates the necessity of great care in the appointment of men to positions of such responsibility as that of public service commissions. The commission form of regulation is on trial in the community, and its future is dependent upon the character of men selected. The public utility companies have a vital interest in this matter because they have come to learn that it is better to place the responsibility for proper regulation upon a regularly appointed commission which gives its time to a study of the questions which arise, than to have these questions left to a large political body like the Legislature. That the proper kind of men can be secured is shown by the records of a large number of conspicuously capable commissioners whose rulings have gained the confidence of both the public and the utilities. The intrusion of politics has complicated matters in some instances to the detriment of the service.

## PURCHASED POWER FOR THE NEW HAVEN

Except for the high guaranteed load factor the contract under which the New Haven Railroad is purchasing power from the New York Edison Company and the United Electric Light & Power Company does not differ materially from others in its class. The load factor clause, however, is quite an important element in this contract. The West Farms substation operates in parallel with the railroad company's Cos Cob power plant. It draws a load of minimum load factor of 70 per cent. The substation, therefore, gets the "cream" of the load, leaving the skim milk for Cos Cob. Consequently, the energy generated in the power plant will cost much more per kilowatt-hour than it would if the power plant supplied the entire demand. In return, however, the railroad is able to buy energy at a low rate, it avoids the necessity for making a very large capital investment at a time when the management is struggling to put the property upon its feet, and, best of all, it secures insurance against interruption of power supply. The single-phase railway does not by any means call for an ideal kind of a load from the stand-

points of either generation or transmission. The ideal condition would be a three-phase, balanced load. The three-phase generating unit has now become so well established as standard that it is used even for single-phase supply, but it is naturally not working under the best conditions as to capacity and regulation when it is forced to furnish single-phase power. These fundamental facts are mentioned as explaining the reason for the requirement of a high load factor by the electric company, especially when a power factor as low as 70 per cent is permitted.

## EVOLUTION OF THE NEW HAVEN ELECTRIFICATION

The execution of the contract referred to in the above paragraph is significant as an event in the development of this famous electrification. While the extension of electrical operation on the New Haven system has not been as rapid as was expected some years back, there has been "something doing" most of the time since the inception of the electrification ten years ago. First came the 11,000-volt Woodlawn-Stamford section with double catenary support for a copper contact wire, which soon had to be supplemented with a steel wire. Next the Harlem River branch was electrified with a compound-catenary overhead construction, giving increased flexibility. Coincidentally, the design of column was improved, and, during this period, also the New York, Westchester & Boston Railway was constructed with similar overhead work. Then the Stamford-New Haven section was completed, somewhat along the same lines but with a novel distribution scheme for eliminating inductive interference with telephone and telegraph lines. This involved the use of auto-transformers, which raised the transmission voltage to 22,000, with one terminal connected to the feeders, the other to the contact wires, and the mid-point to the rails. Simultaneously the distribution of the section originally electrified was remodelled in accordance with the same scheme. While the system was expanding the Cos Cob power plant was doubled in size. Meanwhile many interesting although minor developments have been tried out in the New Haven electric zone. Crane-type column overhead construction was installed on a small scale and found unsatisfactory. The mercury-vapor converter locomotive has had a long and severe test, and series motors of the repulsion type have had service trials previous to their adoption by the Pennsylvania Railroad for the Philadelphia electrification. The latest step in the evolution of the New Haven electrification is the contract, already referred to, for the supply of a large amount of power. The railroad thereby avoids the necessity for increasing its own power gen-

erating capacity by utilizing the capital and operating staff of the electric service company to this extent.

#### DISCUSSION ON WORKINGMEN'S COMPENSATION

The Pennsylvania Street Railway Association did well to devote an entire session to the discussion of workingmen's compensation laws as applied to electric railway companies. Statutes embodying the principle of workingmen's compensation by employers in case of accident as a substitute for the old common law master and servant doctrine are of very recent origin in this country, but the idea of their desirability has spread so rapidly that laws of this character are now on the statute books of a great many States. An examination of recent decisions on the subject shows that there is not only a great variation in the laws in force in the different States but also that the judicial interpretation of even precisely similar words or clauses is different in different States. In one State (Kentucky), it has even been held that full payment under the law to an injured workman was not a bar to his further recovery under the common law because the limitation in amount imposed by the law was in violation of the State constitution. The court, however, made specific suggestions as to points to be modified in order to make such a law constitutional. Other questions upon which judicial interpretation is needed, as it has varied according to the State in which it was rendered, are in the definitions of the word "accident," of the expression "growing out of and incidental to the employment," what constitutes "regular employment," "dependency," "incapacity," "partial disability," etc. Practically all of President Tingley's address was devoted to this subject, and the papers contributed to the discussion, devoted as they were principally to the electric railway aspects of the case, made them of especial interest to electric railway companies.

#### "THREE-WIRE" SYSTEM IN SPRINGFIELD

The announcement in the news columns of this issue to the effect that the "three-wire" system will be used in Springfield, Mass., for the purpose of mitigating the evils of electrolysis compels more than passing attention. This scheme must not be confused with the double trolley wire plan which has been used to some extent. The latter plan involves two collecting devices on the car and a complicated distribution system. It is used mainly on conduit roads and in heavy traction abroad. It has not proved popular for overhead construction. The "three-wire" plan is similar to the familiar Edison system for electric lighting plants, the third "wire" being the rail return. Alternate sections are positive and negative, and if the load is balanced, that is, if the cars under the negative trolley wire are drawing the same total current as those under the positive wire, no current returns to the power station through the rails. The only current in the rails in such an installation is that necessary to supply the locally unbalanced loads, and that incident to connecting the positive and negative sections in series. In this case, the plan has the approval of the Bureau of Standards

and the engineers of Stone & Wester. The willingness of the Springfield Railway to try this experiment will be appreciated by railway men generally. The plan has been tried several times before in this country and abroad. In this country it has been abandoned on account of overhead complications, while abroad the use has been on a small scale only. One such installation, in Brisbane, Australia, was described in a communication printed in the issue of the *ELECTRIC RAILWAY JOURNAL* for Aug. 22, 1914, page 348. In this, J. S. Badger, manager Brisbane Tramways, said that the scheme had proved practicable there while undesirable under most conditions. The fact that the principle has been understood for a long time and has not been generally adopted where electrolysis difficulties existed indicates that the complications have been found serious. For these reasons the results of the service test in Springfield will have great reference value.

#### THE DEMAND FOR SPEED

What has become of our old friend the 100 m.p.h. railway? It is now some time since we have welcomed a definite project to our columns, and we are beginning to have some serious doubts as to whether extreme speed, upon rails at least, would fill any long-felt want. The 100 m.p.h. automobile has already appeared, as witness the results of the last great race, and aeroplanes have pushed the pace even considerably higher than this for fairly long flights. If mankind really wants to devour space at 100 m.p.h. or thereabouts it is pertinent to inquire why none of the various projects for fast electric railways has proceeded beyond the conversational stage. It has been fairly well understood for more than a decade that suitable equipment for such a performance is not in the least a difficult matter. Indeed, more than one electric manufacturing company would take an order guaranteeing the result without raising an eyebrow, and undoubtedly track construction could be provided sufficiently strong to accommodate this speed.

Yet if there were really strong demand for 100 m.p.h. it seems altogether likely that at least one project of the kind between important centers would have come nearer to the stage of realization than anything at present indicates. It looks very much as if mankind were fairly well satisfied with a mile a minute or less and might not be willing to pay the price for anything considerably in excess of such speeds. Indeed, if one looks back both at the list of railway records for pace it is notable that some of those made nearly forty years ago still stand, and that on the whole the more powerful engines of the present day have been devised and operated more with the idea of handling heavy trains than for the purpose of quickening the schedule.

It would be entirely practicable to-day, using merely steam locomotives, to decrease the time between New York and Chicago by five or six hours at considerable increase of expense and some added risk. Electrification of a suitable through line would very likely do even better than this, but are there any definite indications

that there is a sufficient demand now for such service or that one is likely soon to arise? On the face of the evidence up to date we doubt the existence of enough public desire for that kind of accommodation to encourage the promoter. The possibility has stood out boldly in the public eye for a good many years, and the public seems to have smiled genially upon it and turned the back of distrust. As a rule, sooner or later, the public gets what it is willing to pay for, and this is one of the things for which it is apparently not willing to reach deep into its pocket.

To look at the matter quite seriously, all ordinary needs of traffic seem to be met by running speeds of somewhat less than a mile a minute, even for the fastest express trains, and this sort of schedule can be maintained month in and month out in all sorts of weather with very few noticeable delays. Considering the fact that over haste is one of the banes of our national life it is somewhat doubtful whether the gain of added speed is worth while. It certainly is not conspicuous enough to give encouragement in undertaking radical and complete change from the existing order of things. If conditions so alter as to cause an acute demand for quickened service it will probably come, along both on steam and electric lines, somewhat gradually, feeling its way to more sensational achievements. It is now more than twenty years since the first well-organized plan for a 100 m.p.h. electric road was formulated, time enough certainly to have brought it to fulfillment had it really been a thing of large commercial importance. We are sorry to say a fond good-bye to our old friend, the 100 m.p.h. road. It may return some day to find a fresh welcome, but for the present it seems to have departed to that indeterminate limbo which has already engulfed many another sensational project for readjusting human affairs.

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#### A LARGER OUTLOOK FOR THE MANUFACTURERS' ASSOCIATION

One of the recommendations made by President Allen at the San Francisco Convention was that the relations between the Manufacturers' Association and the American Association should be changed so that the former should be "co-equal and recognized in all ways, the same as the Engineering, Accountants, Transportation & Traffic and Claims Association." There is no doubt, as we said editorially in the same issue in commenting on this suggestion, that the interests of the manufacturers of electric railway apparatus and of the companies engaged in electric railway operation are essentially the same. The former prosper with the prosperity of the latter, and depression in the railway business is felt acutely in the loss of orders by the manufacturers. Up to this time there has been, officially, no bond in the way of organization between these two essential parts of what is really the same business except a single clause in the constitution of the American Electric Railway Association. This clause simply authorizes the executive committee of the Railway Association to assign to its "allied" association, the American Electric Railway Manufacturers' Association, the management of the

exhibit features at its annual conventions, and to arrange with it the details of such entertainments as may be given in connection with these annual conventions. At the time this constitution was drafted, these duties seemed to be the principal way, if not the only way, in which the manufacturers could help the railway companies. At that time, the idea of general publicity on the part of the American Association had not been considered. Each company was dealing with its public in the way which seemed best to itself alone, and the problem of public relations, as that problem is now understood, was practically unknown.

It is needless to say that conditions have vastly changed in this respect since 1905, and it is the part of wisdom that as times change people should change with them. The Manufacturers' Association has faithfully performed the work which was assigned to it by the constitution. It has managed the exhibit features of the annual conventions admirably, and it has acceptably arranged the details of the entertainments given in connection with those conventions. It has also from time to time, through convention arrangements and in other ways, been of help to the association financially. But if anyone should say now that he believed the opportunities for usefulness to the electric railway industry of the country by the manufacturers should be limited to those duties only which were assigned to it at the time of the 1905 convention, he would greatly minimize the possibilities. The manufacturers of steam railway apparatus do much more than this to assist the steam railroads in their problems, as the excellent record of the Railway Business Association proves, and there is no reason why the manufacturers of electric railway apparatus should not have the opportunity of being equally helpful. There is still another phase of the situation which has to be considered. Although the manufacturers are as much interested in the progress of the industry and also in the science of railroading, they have been able to attend the conventions only as associate members, and as such, have at least officially not been on the same basis as the delegates from member companies.

To meet this situation the executive committee voted in New York this week to recommend to the membership at large a revision of the constitution which will place companies engaged in the manufacture of electric railway apparatus on the same basis as railway companies, in other words, the manufacturing companies would be "company members." The details of this plan, so far as the schedule of dues, direction of exhibits, etc., remain to be determined, but if the principle is settled, these matters can be worked out easily and in justice to all concerned, including the small manufacturer. This was the principle for which the manufacturers contended in 1905 and ever since many of the manufacturers have said that they did not see why they were not recognized as having as much interest in the objects for which the American Association stood as the railway companies. This contention is now admitted. The plan adopted by the executive committee, in our opinion, should be generally endorsed.

# Purchased Power for the New Haven

The New York End of the Main Line and the Harlem River Branch and the New York, Westchester & Boston Railway Are Now Drawing Power From a New Substation Erected by the United Electric Light & Power Company at West Farms Station

Under a contract which became operative on Sept. 1, 1915, the New York, New Haven & Hartford Railroad is purchasing a minimum of 40,000,000 kw.-hr. annually from The United Electric Light & Power Company. This energy is generated in the 201st Street power station of the lighting company in New York and transmitted in underground conduit to a substation at West Farms, at the junction of the New York, Westchester & Boston Railway and the Harlem River branch of the New Haven Railroad.

The functions of this substation are to adapt the three-phase current from The United power station for the several requirements of the railways, which are as follows:

11,000-22,000 volt, 25-cycle, single-phase power for train operation.

2300-volt, 60-cycle, single-phase power for signaling purposes.

The substation is operated by the lighting company.

The contract under which power is supplied to the railroad provides for primary and secondary charges. The minimum maximum demand is 6500 kw. with a minimum load factor at this demand of 70 per cent, and a minimum power factor for the single-phase service except momentarily of 70 per cent. For loads above the minimum demand the limit of load factor is 50 per cent.

The maximum demand is the sum of the average kilowatts taken by the two classes of service separately during their respective highest sixty-minute intervals in each service year. These intervals are specified not to be those of abnormal demand due to service interruptions.

The substation and the equipment are the property of The United Company. The site belongs to the railroad

company and is leased by The United Company. Provision is made for the terms under which the railroad may take over the building and contents on termination of the contract.

## GENERAL LAYOUT OF THE SUBSTATION

The substation is of the semi-outdoor type, the transformers being located outside of the building and the switching apparatus and auxiliaries inside. The building is 98 1/3 ft. x 49 ft. outside, and a concrete transformer platform about 19 ft. wide extends the length of the building on one side.

Inside the building the most important equipment, much of which is shown in the accompanying illustrations, is as follows:

A switchboard for controlling the incoming power and the distribution of three-phase power, etc. This contains the recording measuring apparatus.

A switchboard for controlling the anchor-bridge switches.

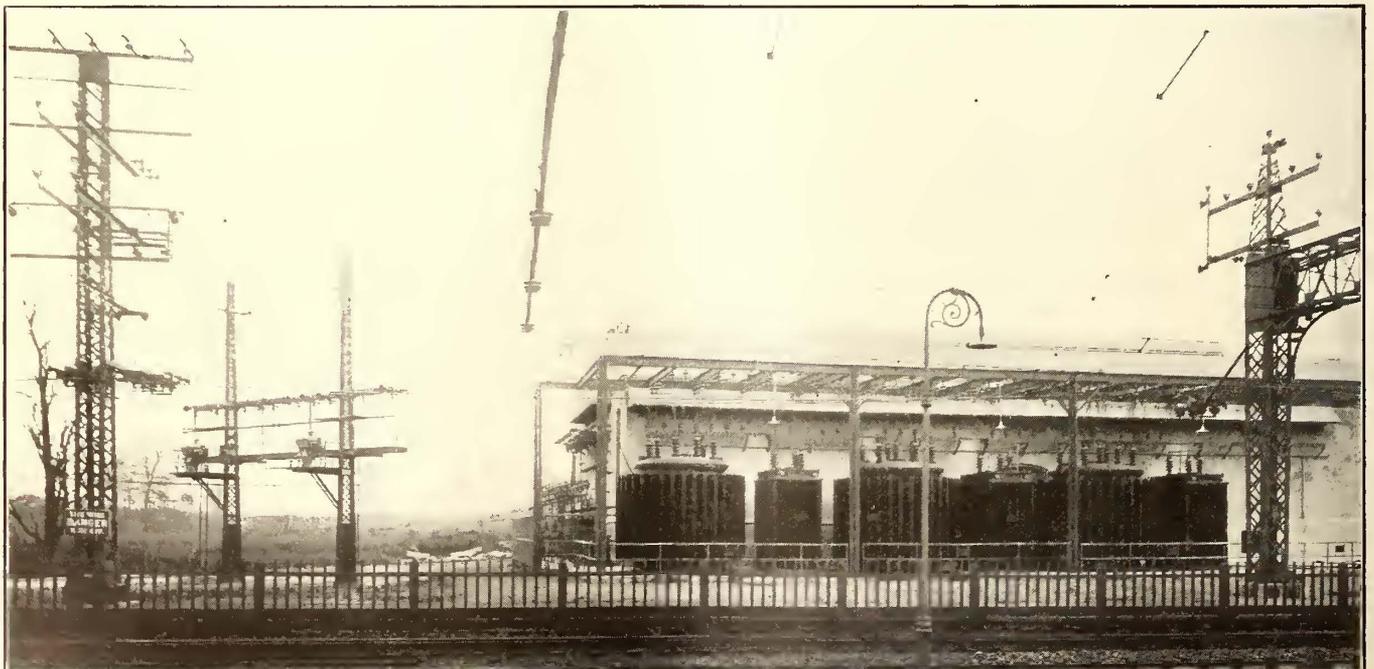
Rows of busbar and switch compartments for 11,000-volt and 22,000-volt service.

A two-gallery, screen-enclosed, grid-resistor compartment, 66 ft. x 11 ft. in size. The grid resistors are used, here as in the Cos Cob power plant of the railroad company, to limit the current flow under short-circuit.

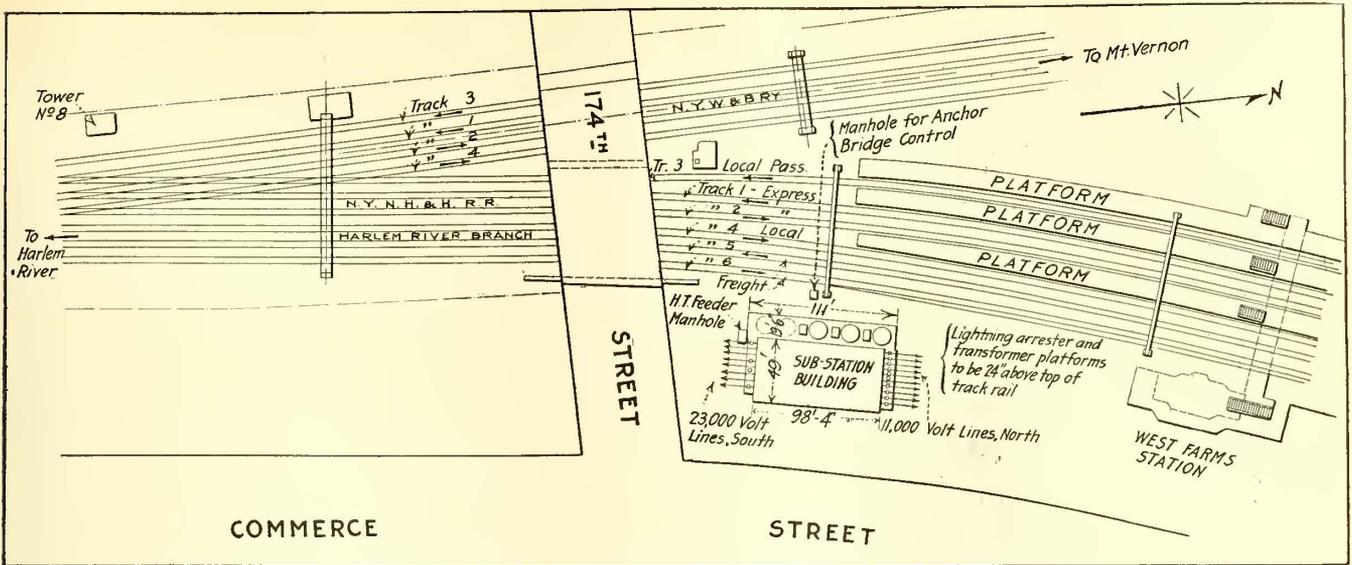
A motor-generator set and storage batteries for supplying switch control current.

## THE OUTDOOR TRANSFORMER

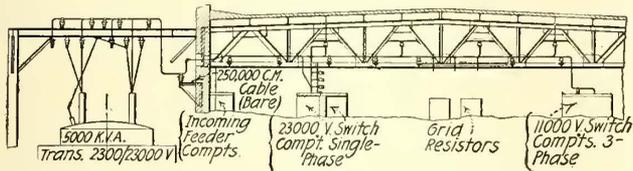
Outside the station are the transformers and the electrolytic lightning arresters. There are three transformer units in operation at present with provision for additions. Each unit consists of a main, 5000-kw. West-



WEST FARMS SUBSTATION—VIEW FROM PASSENGER STATION PLATFORM SHOWING 5000-KW. AIR-COOLED TRANSFORMERS, LIGHTNING ARRESTERS AND FEEDER SUPPORTING STRUCTURES



WEST FARMS SUBSTATION—PLAN OF SUBSTATION, PASSENGER STATION AND NEIGHBORING TRACKS



WEST FARMS SUBSTATION—DIAGRAMMATIC CROSS-SECTION OF UPPER PART OF SUBSTATION

inghouse oil-insulated, self-cooled transformer, and a 1000-kw. teaser transformer, the pair taken together being connected to receive unbalanced three-phase supply and to deliver balanced three-phase voltage and single-phase voltage. The connections for the purpose are explained later in this article.

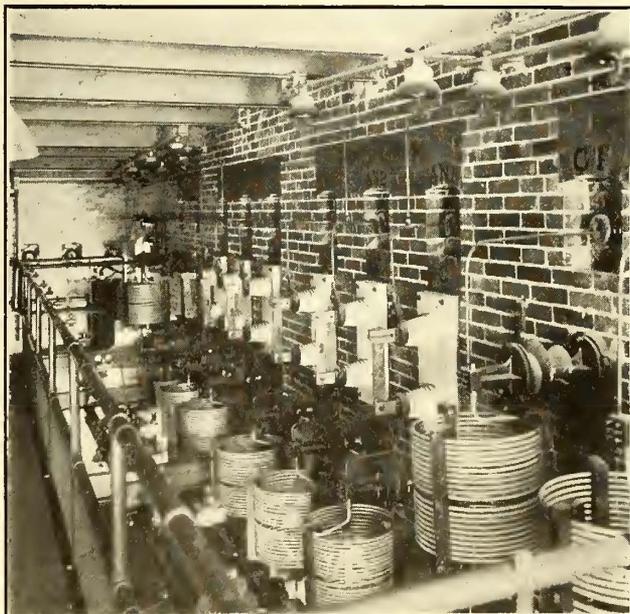
The radiator construction of the self-cooled transformer units at the West Farms substation is an evolution of the tubular oil-cooled construction used by the New York, New Haven & Hartford Railroad for auto transformers of 2000-kva. rating along the tracks of

their system, a description of which is given in the issue of the ELECTRIC RAILWAY JOURNAL for May 2, 1914, page 961. The cooling of the oil results from natural circulation due to the thermal head, or difference of temperature of the oil at the top and the bottom of the radiators.

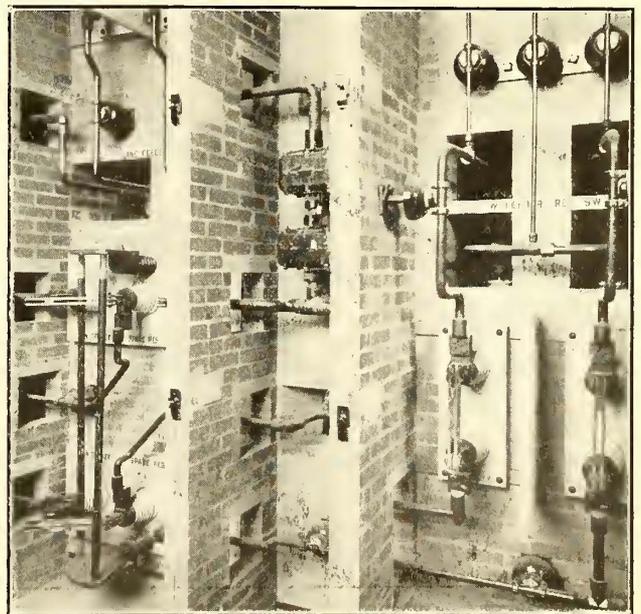
Taps are provided in the windings of the transformers to permit loading to full capacity, at high-tension voltages to 10 per cent above or below normal in 2 per cent steps.

SOME DETAILS OF THE CONDUCTOR SYSTEM OF WHICH THIS SUBSTATION IS A PART

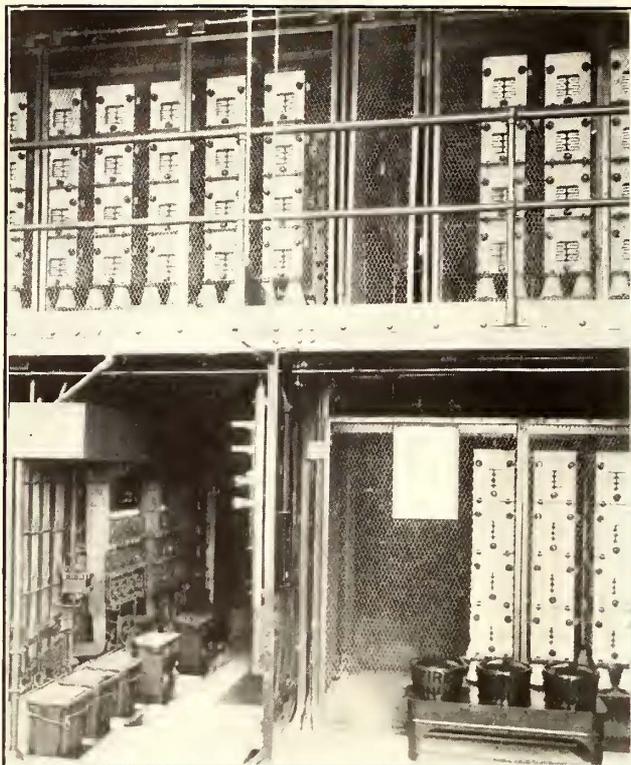
For the supply of propulsion current to the railroad the West Farms substation produces single-phase current. The transmission system is known as a semi-balanced one. The plan was adopted in January, 1914, to minimize inductive interference in telephone and telegraph economy. The contact wires are at the same potential, 11,000 volts above the rail. There are two



WEST FARMS SUBSTATION—LIGHTNING ARRESTER CHOKE COILS, LINE "DISCONNECTS" AND GROUNDING CLAMPS ON HANDRAIL



WEST FARMS SUBSTATION—BUSBAR COMPARTMENTS, SHOWING "DISCONNECTS" AND INSTRUMENT TRANSFORMERS



WEST FARMS SUBSTATION—REAR OF 11,000-VOLT SWITCHBOARD AND SOME GRID RESISTORS

feeders on each side of the railway tracks with auto transformers distributed along the line. The contact wires are connected together and to one terminal of each auto-transformer, while the feeders in parallel are connected to the other with the middle points of the transformers connected to the track. This transmission scheme is similar to the Edison three-wire system except that the direct load is on one side of the circuit, the other receiving its share through the auto transformer which performs the same function as balancer sets in a direct-current distribution system. Complete details of this arrangement were published in the issue already referred to.

Power is received at the substation from the 201st Street power plant of The United Company over 350,000-

circ. mil triplex cable laid in the underground ducts. It is transmitted by the three-wire, two-phase system, with 24,600 volts between outer wires and 17,394 volts between each outer wire and the third wire. The three-wire, three-phase plan is used on account of the desirability of efficiently transmitting power for single-phase and three-phase distribution over the same line.

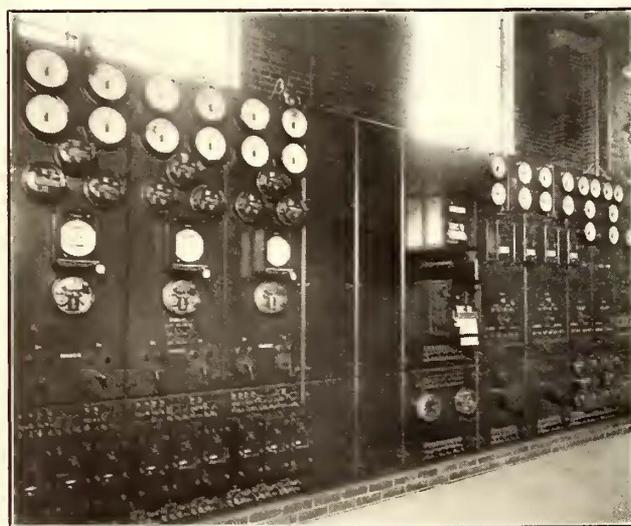
As shown in the large substation wiring diagram the triplex cable, emerging from the pothead, is fanned out for connection, through instrument transformers, to the main and teaser transformers. The two cable terminals between which is the higher voltage are connected across the main transformer primary. The other is connected to one terminal of the teaser transformer primary. The other teaser primary terminal is joined to the mid-point of the main transformer primary.

Single-phase power at 22,000 volts is taken off from the secondary of the main transformer which has a 1:1 ratio of transformation, except as adjusted by use of the regulating taps.

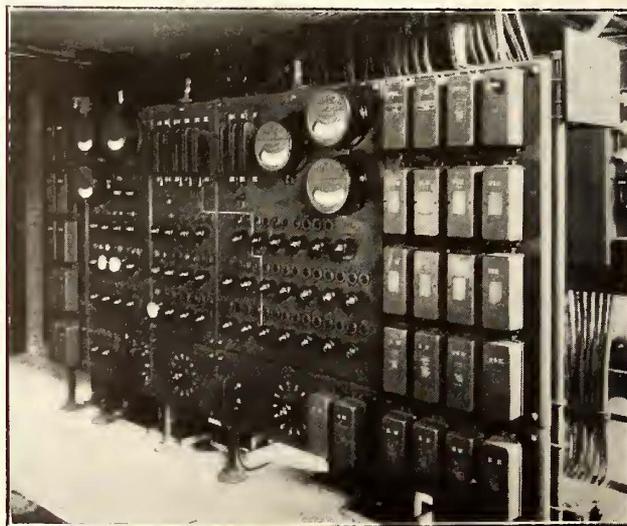
Three-phase power at 11,000 volts is taken off from one terminal of the teaser secondary and two points midway between the center and the terminals of the main transformer secondary. The other teaser terminal is tapped in at the center referred to.

PROVISION FOR CLEARING RAILWAY SYSTEM OF GROUNDS

On account of the importance of the part played by the grid resistors and their control switches in the reliable operation of the railway system, the details of the sequence of operation of the several relays and switches have been determined with great care. An accompanying diagram is reproduced to make these clear. In this the sequence is indicated by consecutive numerals in small circles. With a short on the contact wire (indicated by the cross) the following operations occur consecutively: (1) The double-ratio current transformer energizes its corresponding coil of the selective relay and also the overload and restoring relay. (2) Current passing through the lower coil of the selective relay separates the lower contacts, thus selecting the feeder switch to be tripped. (3) At the same time the overload and restoring relay closes the upper contactor circuit of the selector relay, actuating the trip coil of the feeder resistor switch and energizing the



WEST FARMS SUBSTATION—LIGHTING COMPANY'S SWITCHBOARD FOR INCOMING LINES, OUTGOING THREE-PHASE LINES, AND LOCAL LIGHTING AND POWER, WITH RECORDING INSTRUMENTS



WEST FARMS SUBSTATION—RAILROAD COMPANY'S SWITCHBOARD, SHOWING ANCHOR BRIDGE SWITCH CONTROL, RELAYS AND INDICATING INSTRUMENTS

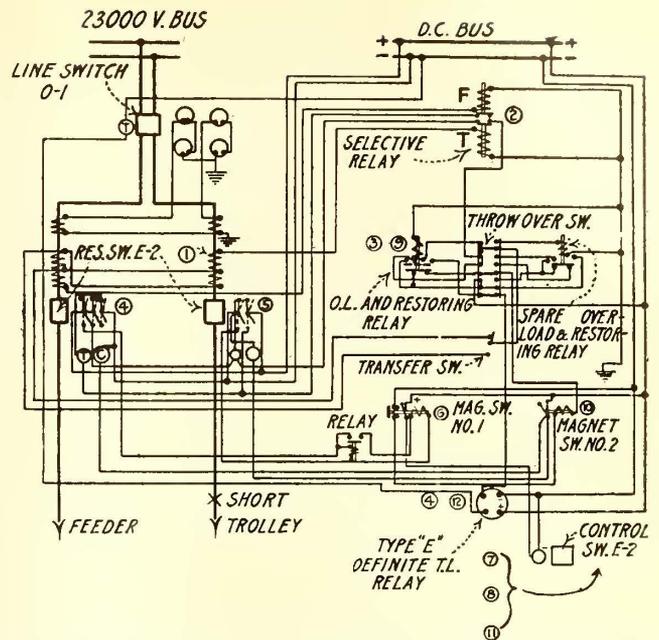
Type E definite time limit relay. (4) When the resistor switch opens, the pallet switch is thrown into the dotted position, energizing the trip coil of the trolley resistor switch. (5) The latter on opening throws the pallet switch into the dotted position, energizing magnet switch No. 1. (6) On operating, this switch closes its contactors, as shown by dotted lines, thereby preparing the coil of magnet switch No. 2 for energizing current and allowing energy to flow through the closing coil of bridge control oil circuit breaker. (7) On closing, the control switch energizes the bridge control circuit. (8) The bridge switch, if still overloaded with the resistors in series, then opens and removes the "short." (9) When the ground is cleared the contact bar on the overload and restoring relay drops onto the contacts, energizing magnet switch No. 2. (10) This in turn moves its contactor into the dotted position, thereby closing both of the resistor switches. (11) Simultaneously with the closing of the resistor switches the bridge control switch opens and normal conditions are restored. (12) In case the "short" remains and the bridge switch fails to open, however, the definite time limit relay energizes the tripping coil of the Type 0-1 line circuit breaker, opening same, in which case it has to be closed by hand. Signal lamps on the switchboard indicate the position of all switches.

**PROVISION IN THE POWER PLANT FOR GENERATING RAILWAY POWER**

The problems involved in carrying the railway load from the standpoint of the electric service company included provisions for handling single-phase loads in the steam generating station and the operation of this station through the West Farms substation in parallel with the Cos Cob plant of the railroad company.

In The United Company station there are two three-phase, 20,000-kw., 6600-volt 25-cycle turbo-generators. These have the highest rating to date of generators operating single-phase. They supply power to T-connected air-blast step-up transformers, the main units of which are rated at 5500-kva., also the largest of their kind yet made. The winding connections of the transformers in the generating station and substation are shown in the wiring diagram on the following page. The new turbine equipment was added without increase in the boiler plant which had been installed to provide for future demand.

When the turbo-generators are operating three-phase at 100 per cent power factor, with 185 lb. pressure and 100 deg. superheat, the steam consumption will not



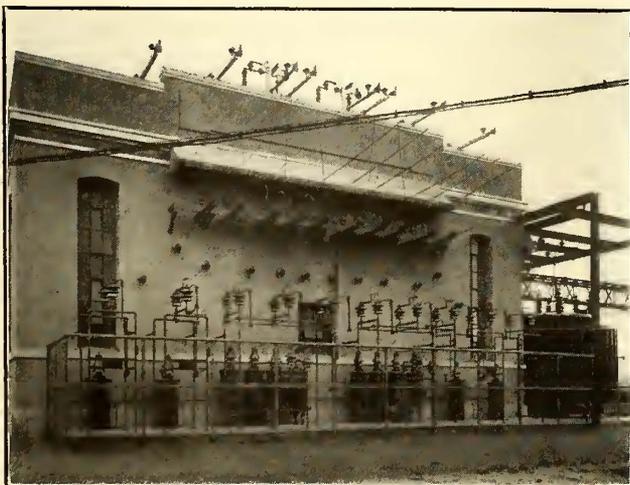
WEST FARMS SUBSTATION—DIAGRAM SHOWING SEQUENCE OF OPERATIONS IN CLEARING GROUNDS

exceed 14.3 lb. per kilowatt-hour with a load of 5000 kw., 12.07 with 11,000 kw., and 12.63 with 20,000 kw. When using a manually-operated supplementary valve, the steam consumption is guaranteed not to exceed 12.1 lb. per kilowatt-hour with a load of 13,000 kw. and 12.13 with 15,000 kw. The consumption when operating single-phase at 70 per cent power factor will not exceed 14.37 lb. with a load of 5000 kw. and 12.14 lb. with 11,000 kw.

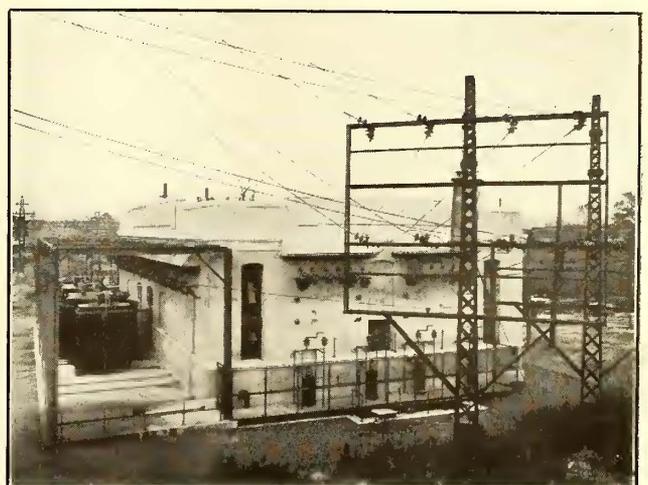
Air for cooling the generators is chilled, humidified and washed by Metropolitan air washers and is then forced into the end bells of the units by motor-operated blowers. Each blower is capable of supplying 60,000 cu. ft. of air per minute, and is driven by two three-phase 440-volt motors, each capable of running the blower alone. The generators can be excited from any exciter in the station in conjunction with an automatic voltage regulator.

A 3750-kva. single-phase frequency changer set has been installed to permit the 60-cycle equipment to reinforce the 25-cycle supply if necessary.

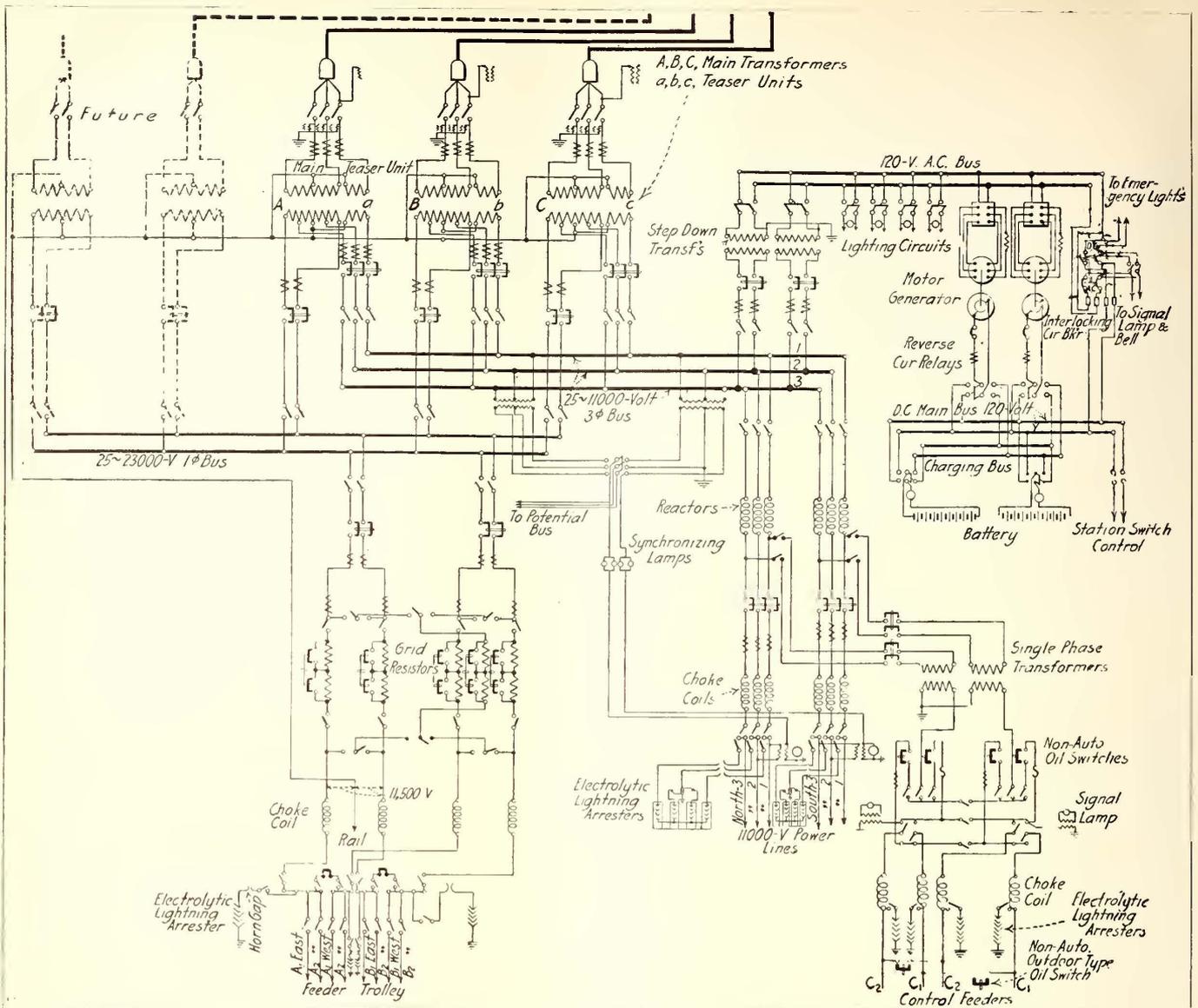
Each of the main 5500-kva. air-blast transformers at The United Company generating station is operated with



WEST FARMS SUBSTATION—NORTH SIDE, SHOWING 11,000-VOLT LIGHTNING ARRESTERS AND RADIATORS OF 5000-KW., SELF-COOLING TRANSFORMERS



WEST FARMS SUBSTATION—SOUTH SIDE, SHOWING TEASER TRANSFORMERS, 23,000-VOLT LIGHTNING ARRESTERS AND FEEDER SUPPORTING STRUCTURE



WEST FARMS SUBSTATION—GENERAL ELECTRIC CIRCUIT DIAGRAM OF SUBSTATION WIRING AND EQUIPMENT

a 1000-kva. teaser transformer through T-connections, the reverse of the arrangement described for the substation. The bank steps up the generator voltage from 6600 three-phase to the values already stated. Two low-tension leads and a low-tension neutral are brought out through the top of the main transformer case, as well as two high-tension leads and neutral leads. The high-tension neutral is grounded to the case but the low-tension neutral is not. The high-tension neutral is capable of carrying the full current of the winding. The regulation of these units is specified at 11 per cent when carrying 13,750-kva. load at 60 per cent power factor. A separate winding, which has a rating of 20 kva. at 210 volts, is connected permanently to the air-blast motor, so the latter will start as soon as the transformer is energized. The inherent reactances of both the main and teaser transformers are 5 per cent.

### Report-Writing Course

An important addition to the curriculum of the Massachusetts Institute of Technology has recently been made in the shape of a course in report writing. Instruction in this desirable direction is given to students in engineering administration, with the object of strengthening what is at present a weakness in the qualifications of technically trained men for the broadest field of useful-

ness. The technique of the course consists largely in the solution of problems, followed by reports thereon from two points of view: First, that of the magazine article or popular presentation, and, second, a more concise story, in which details are included in appendices so that the report itself may be the more direct.

Some of the problems have been highly practical, the first assigned being a written application for a position, with statement of individual qualifications. Next the students received a letter from a chauffeur who had saved money and desired to start an auto-truck sight-seeing business. The students, as engineers, weigh the different aspects of the matter, competition, demand, condition of business in general and present their conclusions. Another problem was the benefits of the fare-collecting equipment used on the Boston Elevated Railway, with the expediency of extending its use, and following a lecture on the dye situation in America, a report was presented on the practicability of establishing a plant for the manufacture of dyes. Finally, the students have investigated the desirability of an electrical-ly operated blue-printing outfit for the new buildings of the institute at Cambridge, reporting to President MacLaurin. The reports are examined and criticised by the professors. About eighty juniors are now engaged in this work, which is under the immediate direction of William Green of the English department.

# Pennsylvania Association Meets

Electrification, Shop Methods, and Proposed Safety Rules and Code Form Topics of Discussion at Scranton Meeting on Dec. 14—At Meeting on Dec. 15 Delegates Consider Problems Arising Under New Pennsylvania Workmen's Compensation Law

The winter meeting of the Pennsylvania Street Railway Association was held on Dec. 14 and 15 at the Hotel Jermyn, Scranton, Pa. The first session, on Tuesday afternoon, was devoted generally to the subjects of railway electrification and shop methods and to the committee report on the proposed safety rules and code of the Bureau of Standards, while the concluding session was given over to addresses on workmen's compensation for accidents. This subject was of particular interest on account of the new Pennsylvania law going into effect on Jan. 1, 1916.

The first meeting was opened by President C. L. S. Tingley, second vice-president American Railways, whose address is abstracted elsewhere in this issue. In connection with his remarks President Tingley brought to the attention of the delegates the fact that a campaign has already been started for the passing of laws affecting electric railways by the next Legislature. He said that at the second annual conference on welfare and efficiency, recommendations were made in favor of automatic instead of linked couplings; for the use of air brakes as the standard instead of hand brakes; for the requiring of vehicles operating between sun-down and sun-rise to display lights on the front, the rear and the sides; and for the use of vestibules on summer cars and the abolition of running boards. President Tingley also cited the model health insurance bill of the American Association for Labor Legislation, this bill providing for a commission similar to the new compensation commission and requiring the industry to bear the burden of sickness of, as well as accidents to, employees.

## ELECTRIFICATION AND SHOP METHODS

After the reading of the treasurer's report by Henry M. Stine, the questions referred to the Question Box were presented by W. A. Heindle, superintendent Southern Pennsylvania Traction Company, Chester, Pa., for later discussion. N. W. Storer of the Westinghouse Electric & Manufacturing Company then gave a general talk on railway electrification, and J. F. Layng of the General Electric Company read a paper on "Shop Methods." Mr. Storer's remarks are published elsewhere this week in abstract form, while Mr. Layng's paper will appear in a later issue.

In the discussion on Mr. Layng's paper W. B. Rockwell, manager Eastern Pennsylvania Railways, Pottsville, Pa., said that city and interurban operation differ widely on the question of maintenance, and that the operating costs on interurban lines would run way up if city practices were followed. Mr. Heindle thought that Mr. Layng's remarks referred to inspection and not to general overhauling and wanted to know what would be the figures for maintenance when cars were taken out of service at stated intervals and generally overhauled.

Mr. Layng explained that on account of the size of the subject his remarks had been confined only to city service. The system from which his figures had been taken had moderately new equipment, and there would undoubtedly be systems where twice as many men would be required for the shop work on the cars. Local condition, the lay-out of the country and the type of motor used would make a great difference.

Mr. Rockwell said that a manager should make sure that every car was in first-class condition before letting it go out of the carhouse, and Mr. Layng felt that companies which put money into inspection saved much on material.

## PROPOSED SAFETY RULES AND CODE

The report of the committee on the proposed safety rules and code of the Bureau of Standards was then read by Chairman Gordon Campbell, president York (Pa.) Railways. On behalf of the committee on this subject, Mr. Campbell made a progress report. He traced the development of Circulars 49 and 54 issued by the Bureau, with the title, "Safety Rules to be Observed in the Operation and Instruction of Electrical Equipment and Lines" and "Proposed National Electrical Safety Code" respectively. These have been discussed from time to time in this paper.

The "Suggested Standard Safety Rules for Electrical Apparatus" which were offered at the second annual industrial welfare and efficiency conference conducted by the Department of Labor and Industry of the State of Pennsylvania were also mentioned. It was stated that Dr. E. B. Rosa of the Bureau of Standards had presented a paper at that conference urging the adoption of a single set of safety rules by the several states. This suggestion was approved at the 1914 annual meeting of the Pennsylvania Street Railway Association.

Mr. Campbell then explained what had been done recently by way of co-operation with the A. E. R. A., the C. E. R. A. and the N. Y. E. R. A. in formulating suggestions for improvements in the proposed rules of the Bureau of Standards. In conclusion the members were urged to forward suggestions to reach the A. E. R. A. office not later than Dec. 20, 1915.

After the report Mr. Campbell read a letter from Dr. Rosa to the effect that the Bureau of Standards is continuing the study of the variations in the strength of construction as required by the weather conditions in various sections and also the study of the separation of transmission lines of high voltage. In the ensuing discussion the point was raised that the proposed code will prove burdensome on account of the necessary expenditures involved. Mr. Storer thought that a factor of safety of two was not excessive and the companies should not oppose it. As for the added labor required by the code, that was a different question. President Tingley stated that while he did not desire to criticize the Bureau of Standards, he felt that it was not sufficiently acquainted with the working conditions of small properties, on which the proposed rules bear with great weight, and that the association should protect such companies.

It was next announced that on account of the storm in eastern Pennsylvania E. C. Spring, assistant to president Lehigh Valley Transit Company, Allentown, Pa., was unable to be present to read his paper on "Efficiency Through Conservation in Time in Interurban Traffic." His paper, however, is released to the members through the ELECTRIC RAILWAY JOURNAL, as shown elsewhere.

Committees on nomination of officers, auditing and resolutions were then appointed, and the session adjourned. Trips in special cars had been arranged for

after the session to the shops of the Scranton Railway and the power plant of the Scranton Electric Company. At 8 p. m. an informal dinner was served to members of the association and guests at the Hotel Jermyon.

### WEDNESDAY'S SESSION

In opening the session on Wednesday morning President Tingley referred to the importance of safety work in connection with workmen's compensation laws, and mentioned the slogan "Be careful first" as being less selfish than "Safety first." He said that railways should not object to compensation laws on the ground of the safety devices that would be necessitated, for such devices should have been put on machines in the beginning, and he pointed out to the manufacturing companies the desirability of designing machines with safety appliances as integral parts thereof.

H. P. Megargee, assistant to vice-president American Railways, Philadelphia, Pa., then gave a talk on safety methods and devices, with illustrations from the shops of the Chicago & Joliet Electric Railway, Joliet, Ill. This talk will be abstracted in a later issue. In the ensuing discussion the fact was emphasized that the hazard of new employees is a vital point in safety work to be overcome through a proper training and cautioning of new men, and C. B. Fairchild, Jr., executive assistant Philadelphia (Pa.) Rapid Transit Company, told of the experience of his company in combining safety inspection work with fire prevention inspection without any increase in the force used for the latter or in the cost thereof.

The remaining addresses were devoted to different phases of workmen's compensation legislation, as follows: "Some Practical Questions Arising Under Workmen's Compensation Law," by Lefferts S. Hoffman, general attorney Public Service Corporation of New Jersey, Newark, N. J.; "Workmen's Compensation Liability in Pennsylvania," by H. A. Mackey, chairman Workmen's Compensation Board, Harrisburg, Pa.; "Mutual Insurance Against Workmen's Compensation Liability," by Walter S. Bucklin, president Massachusetts Employers' Insurance Association, and "Stock Company Insurance," by R. H. Keffer, general agent Aetna Life Insurance Company, Scranton, Pa. The addresses by Mr. Hoffman and Mr. Mackey are abstracted elsewhere in this issue.

### MUTUAL INSURANCE

Mr. Bucklin brought to the delegates a message from large employers in Massachusetts who had had four years' experience in compensation work. The Massachusetts law at first proposed provided that all insurance should be carried by one large mutual co-operative company managed and controlled by the employers themselves, on the basis of modern efficiency and economy, but in the final draft passed the State was thrown open to the competition of private commercial companies. The State helped to introduce a mutual company controlled by the policy-holders, however, and under the guidance of the best actuary obtainable rates were prepared and published three weeks prior to the effective date of the act. The stock companies withheld their rates until three days before this date, so that the mutual company was compelled to get 100 employers to join it without knowing whether or not the new stock company rates would be as high. Later the stock companies cut their rates 25 per cent and finally as much as 30 or 40 per cent.

Mr. Bucklin said that the organization of this mutual company, the Massachusetts Employers' Insurance Association, provides for different groups, as one for man-

ufacturing companies and one for street railways, each working out its own experience. A few very large companies are carried, each in a group by itself. The company has charged lower rates, paid compensation in full and returned an average annual cash dividend of 30 per cent to the member employers, besides accumulating a surplus of \$400,000. There is no stock, the only income being the premiums that would otherwise be paid to the commercial companies. Mr. Bucklin said that State fund insurance is really a mutual plan conducted by the commonwealth, but that the most desirable plan is one mutual company to be controlled by the employers themselves, managed by competent insurance men and fully equipped with safety and claim departments conducted on a humanitarian rather than a profit-making basis.

Of all preventable injuries, said Mr. Bucklin, 50 per cent can be prevented only by the education of the employee. The Massachusetts mutual company has recognized the importance of the growing science of safety engineering. It has a specialist for analyzing the problems of street railways and making recommendations along safety lines, and it conducts a wide safety campaign through such media as lectures, views, bulletins, payroll slips and the like. The company has in Boston an out-patient hospital for the employees of the Boston Elevated Railway and the Bay State Street Railway. Where these companies formerly paid \$5 for first aid and frequently the same charge for subsequent treatments, the mutual company is now giving these services in each case for an average of \$1.80.

To Mr. Bucklin's mind one of the most valuable features of his company has been the condition whereby the street railways have been freed from the responsibility of adjusting claims with employees. It is his experience that when injured employees are told by the railway that arrangements have been made whereby their compensation will be adequately handled by the mutual company, both the employees and the labor unions are fully satisfied. In closing, Mr. Bucklin stated that the Mutual Compensation Insurance Company of Pennsylvania was being formed to apply the Massachusetts plan to Pennsylvania, and it was possible that a separate group would be made in this company for street railways. The experience already gained in Massachusetts would enable the company to work out the problems so as to save more money to the street railways and foster better relations with the employees than possible in any other way. In Pennsylvania the rates had to be the same as those of the stock companies, but the saving would be in the cash dividends returned.

### STOCK COMPANY INSURANCE

Mr. Keffer said that the companies desiring protection had only to consider the solvency of stock companies. All large stock companies had more experience data than mutual companies, and they maintained costly inspection services for the benefit of the policy-holders. All in all stock companies could give cheaper insurance than mutuals on account of the service rendered and the value of the business done. State funds in operation were said to be showing losses, and in view of the fact that the Pennsylvania law requires the State fund rates to be "adequate," the danger of an assessment disguised under increased rates was hinted at. As to compensation liens on real estate, which, it was said, would not receive the necessary certification by the commission for filing against State fund subscribers, Mr. Keffer maintained that these liens were permitted by the act to be relieved by the stock companies and that his company was pledged in its policies

to take care of such liens so as not to have them stand against the property. Hence the asserted superiority of the State fund plan on this basis was a negligible point.

#### DISCUSSION ON WORKMEN'S COMPENSATION

H. W. Foster, chief engineer Independence Inspection Bureau, Philadelphia, Pa., believed that self-insurance for street railways was feasible under certain conditions. In adopting this method the employer would face the responsibility for medical attention, claim service, accident prevention service and compensation payments, in all of which respects the street railways by virtue of their established practices for handling injuries to the public should in general be competent also to take care of employees' injuries. A point of danger, however, arose in connection with extraordinary claims for catastrophes, and for this reason there was an opportunity in Pennsylvania for insurance against special risks. Mr. Foster then mentioned the Excess Inter-insurance Exchange organized in Philadelphia and said that insurance against catastrophes under some such organization when the rate is fairly proportioned to the whole insurance rate and accident inspection service is rendered, might prove a wise plan for the railways leaning toward self-insurance.

E. W. Heilig, secretary of the welfare committee Public Service Corporation of New Jersey, then described some of the features of this company's welfare plan, the spirit of which the New Jersey compensation act follows. In the last four and one-half years 27 per cent of the 10,000 accidents had come under the act. The cost to date for compensation had been \$2.62 per man, with outstanding claims not included, while the welfare plan had cost \$5.96 per man. It was found, upon investigation of the probable compensation for all cases under the compensation act the first year, that the payments required would be about the same as under the old common law plan. President Tingley said that for the accidents of the last five years on the Scranton Railway the amount expended under the old plan and the amount required under the compensation act differed less than \$100, the claim and legal department costs being excluded because of the maintenance of these at no less efficiency for public accident service.

Mr. Rockwell said that he had favored self-insurance because his company had practically been doing this for several years. He was impressed, however, with the mutual plan but feared that the extension of such companies into other than the original states where incorporated indicated a money-making desire. Mr. Bucklin explained, however, that the co-operation of different mutual companies or the extension of work with common inspection and claim service made for increased efficiency and lowered costs, just as in the case of the mutual fire insurance companies. Mr. Mackey explained how stock companies spend 43 per cent of the premium for overhead and how the State fund rates had been put about 10 per cent below the stock rates because of the lessened overhead. Mr. Rockwell asked why it would not be better to adopt self-insurance and avoid paying rates covering any overhead, and Mr. Mackey, while disclaiming any desire of the compensation board to favor any insurance plan, said that probably every big going concern that could show satisfactory financial responsibility could do better by insuring itself. As to what would constitute proof of such financial responsibility, Mr. Mackey remarked that the board had no fixed rule and wanted to cut all the red tape possible. While a form had been prepared, the board desired any showing in a company's own way that would prove its responsibility. The steam railroads had already been allowed to strike out the questions on the form and

submit the latest annual report. Mr. Mackey then mentioned the point that the board preferred parent companies to report for their subsidiaries and to assume the compensation therefor. As for examinations of employees, he said that the board was not concerned with the real duty of companies in starting out right under the act, but for obvious reasons discrimination among employees would prove unwise. Mr. Bucklin then added that the annual overhead expense of the Massachusetts mutual company was only 15 per cent of the premium. The matter of catastrophes was handled by mutual companies through providing re-insurance policies whereby the first loss up to a certain figure was handled by the mutual companies and any higher loss fell on inter-insurance companies.

A motion by A. E. Wildt, engineer of power and equipment Scranton Railway, providing for an improvement in the safety-first slogan, "certainty first" being mentioned, was referred to the executive committee. The Question Box was passed over on account of the lateness, and the questions will be answered by mail by the chairman. Mr. Fairchild moved that the meetings of the association be held on the third Tuesday and Wednesday in May and the third Tuesday and Wednesday in November, so as to secure better weather conditions, and the question was referred to the executive committee.

The meeting then closed with the election of the following officers and executive committee: President, T. A. Wright, vice-president and general manager, Wilkes-Barre (Pa.) Railway; vice-president, Gordon Campbell, president York (Pa.) Railways; secretary and treasurer, H. M. Stine, Harrisburg, Pa.; executive committee: T. A. Wright; Gordon Campbell; T. B. Donnelly, claim agent West Penn Traction Company, Pittsburgh; C. L. S. Tingley, second vice-president American Railways, Philadelphia, Pa.; C. B. Fairchild, Jr., executive assistant Philadelphia (Pa.) Rapid Transit Company, and Thomas Cooper, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

#### PRESIDENT'S ADDRESS

BY C. L. S. TINGLEY, SECOND VICE-PRESIDENT AMERICAN RAILWAYS, PHILADELPHIA, PA.

The general business depression beginning to be felt at the time of the meeting a year ago was aggravated for electric railways by the advent of the jitney, which, in the cities where it became prevalent, made—for the time being at least—great inroads into the receipts of the electric railways. This is a subject upon which all member companies should place before the public the fullest information, confident that the public, in possession of the facts, will realize the necessity in its own interest of regulating a condition which not only threatens the prosperity and so the usefulness of an instrumentality of transportation essential to all communities but which brings in its wake effects most harmful to the public itself.

The association, through its executive committee, authorized the president to take such steps as he might deem necessary to bring this question before the Pennsylvania Public Service Commission. In pursuance of this authority, he appeared with counsel before the commission on June 18 and prayed them to take jurisdiction over the whole jitney situation on the ground that the jitneys were common carriers and therefore were operating in violation of the public service commission law when they failed to get certificates of public convenience before beginning operation and when they failed to file their tariffs. After some time the commission requested the association to withdraw its petition, which it did.

After a careful search of the State for a case against some man of property who would let a case go through to decision, the Scranton (Pa.) Railway made three complaints against M. J. Walsh, W. H. Owens and S. Wilson, and F. Williams, these three cases being heard in Scranton on Oct. 14. It was either proved or admitted that these men were performing the service of carrying passengers for hire by trips over fixed routes on more or less definite schedules, and it was therefore asserted by the complainant that they were common carriers. The attention of the commission was called to the fact that the regulatory law includes all common carriers and that common carriers include persons engaged in the transportation of passengers for profit. In support of this contention the following citations were made: An act of the State of Georgia, approved on Aug. 22, 1907; Georgia Railway & Power Company *vs.* Jitney Bus Company, *et al.*, Public Utility Reports 1915-C, page 928; an order of the Public Utilities Commission of the District of Columbia made on Aug. 28, 1915; an order of the Illinois Public Utilities Commission in the case of Jacksonville Railway and W. B. Miser *vs.* L. F. O'Donnell,\* and Charleston Interurban Railroad *vs.* Clyde Smith *et al.*, Public Utility Reports 1915-E, page 177. For a suitable definition of the word "common carrier" the following cases were cited: Lloyd *vs.* Haugh, 223 Pennsylvania 148; Donnelly *vs.* Philadelphia & Reading Railroad, 53 Superior Court 78; Primrose *vs.* The Casualty Company of America, 37 County Court Reports 441; Dwight *vs.* Brewster, 18 Massachusetts 50; Gordon *vs.* Hutchinson, 1 W. & S. 285, and Fuller *vs.* Bradley, 25 Pennsylvania 120. The decision of the commission has not yet been handed down.

The legislature had before it during its last session many bills of interest to the industry, which were reported from time to time in the bulletins issued from the secretary's office. Unquestionably the most important of the enactments was the workmen's compensation act, which goes into effect on Jan. 1, 1916. This is revolutionary, for it is an entire change in the economic aspect of injuries to employees. This is well pointed out in a decision of the Supreme Court of Washington in which it uses this language:

"To say with appellant that the intent of the act is limited to the abolishment of negligence as a ground of action against an employer only is to overlook and read out of the act and its declaration of principle the economic thought sought to be crystallized into law, that the industry itself was the primal cause of the injury and, as such, should be made to bear its burdens. The employer and employee as distinctive producing causes are lost sight of in the greater vision that the industry itself is the great producing cause and that the cost of an injury suffered in any industry is just as much a part of the cost of production as the tools, machinery, or material that enter into that production."

In view of this radical change in the relationship which companies bear to their employees, it has seemed wise to place this subject upon the program for a full discussion. One or two phases of the question, however, which have not found a place upon the program should be mentioned. For example, instead of State, mutual or stock company insurance, the employer may carry the risk himself. This possibly can be safely done by large concerns, but in arranging to do so the catastrophe hazard must not be overlooked.

Furthermore, it is to be regretted that the definitions

\*In this case the commission held:  
"From the evidence in this case, the commission finds that the respondent owns, controls, operates and manages, within this State, for public use, a number of automobiles which he is using for the transportation of persons for hire between points within this State and that in the conduct of such business the respondent is a common carrier of persons and is a public utility within the meaning of the act. \* \* \*

contained in the act are not perfectly clear, so that there will be many questions arising which will have to be determined by the courts. For instance, the term "employee" as used in the act is declared to be synonymous with "servant," but in seeking a definition of the word "servant" it is found to have been construed in almost every way that one can possibly wish. It has been suggested by counsel, however, that the working of the act with respect to the compensation being based on "daily or weekly" wages confines its operation to subordinate employees. Who is omitted from the operation of the act, however, under the term "casual employees"? Cases do not give much help here. It is also to be regretted that the act does not specifically provide for the exemption from its operation of carriers who are engaged in interstate commerce and who therefore come under the federal liability law. The decisions of the courts in this class of cases have been quite contradictory, but seem to be settling down to a holding which would warrant the assumption that practically any employee of an interstate carrier is engaged in interstate commerce.

It is unfortunate that the words "arising out of and" have been omitted from the act. As it is, companies are called upon to make compensation for all accidents in the course of employment whether or not they arise out of the employment. There are a long line of decisions, both in this country and in England, in which the distinction is clearly drawn, and it can be readily seen that in many cases the absence of these words will work a hardship and injustice upon the employer. Out of eighty-five enactments of this character that have been examined—thirty-two of the United States and fifty-three foreign—only seventeen omit the words "arising out of," and only six of these are in the United States—namely, the state acts of Pennsylvania, Ohio, Texas and Washington, the federal employees' act of May 30, 1908, and the canal zone act, the latter two being more in the nature of pension acts than compensation acts. Ohio and Pennsylvania are the only industrial States which omit these words. West Virginia's original enactment omitted them, but they were inserted in the amended act approved on Feb. 26, 1915. Of the foreign countries excluding this language the only important ones are Austria, Germany and Hungary, the others all being comparatively small countries with the possible exception of Japan. It is unfortunate also that the words "willful disobedience of orders or rules, and intoxication" are omitted from the bars to recovery.

There is another serious matter to be carefully guarded against, and that is the question of hernia. This has been found so serious in West Virginia that the Legislature amended the act, and the radical language used shows that there must have been a very serious abuse of the compensation law on this point. It would seem that the only safeguard for an employer in this State is to require a medical examination before employment. If the prospective employee refuses to submit to such examination, the company should either refuse employment or compel him to reduce such refusal to writing. Then this refusal can be presented to the compensation board in case claim is made for disability arising from hernia or other organic defects.

There also arises under these laws a class of cases which affect electric railways as carriers as distinguished from employers, viz., an accident to an employee of a third party in the course of his employment, his employer being subrogated to his right of action against the carrier. A good example of this class of cases is Newark Paving Company *vs.* Klotz (91 At. Rep. 91), although at that time in New Jersey the employer was not subrogated to the right of the employee. In this case

the administratrix of a workman of the defendant company sued to recover for his death (the decedent was struck by a street car and killed while fixing his wheelbarrow). Compensation was awarded, notwithstanding a prior release to the street car company upon payment by it of \$800. Now, since this act does not take negligence into consideration and since a man hurt in the course of his employment must be compensated by his employer, will not companies in a majority of cases of this class have the employer or his insurer assisting the man, if not actually suing on his behalf? And will not this interest of the third party make it more difficult to prove negligence?

#### EFFICIENCY THROUGH CONSERVATION OF TIME IN INTERURBAN TRAFFIC

BY E. C. SPRING, ASSISTANT TO PRESIDENT LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

The interurban lines of the country are to-day confronted with the problem of giving greater speed of service. The question is not, as it was a few years ago, a matter of frequency of service. In meeting this new condition, many things must be taken into consideration.

What appeals most to the masses traveling is through service to distant points without transfer, and inter-traffic arrangements are being made by many companies so that passengers can go from one point to another without change. In cases of this character, a heavy increase in traffic has been the result. Where companies adjoin each other, physical connections and through service should be maintained. The use of this class of service has been most advantageously demonstrated in the Middle Western States and has done more to place the interurban lines in a position to compete with the steam railroad lines than any other factor.

The general minimizing of time demands serious thought. The elimination of curves, the replacing of tracks upon private rights-of-way wherever it is possible and the relocating of tracks outside of towns are all matters of serious import. In the past it was thought that lines must traverse every municipality and cover every street in order to get the business in the community, but it is being found that just as much traffic can be secured by going on the outside and around the towns. The Lehigh Valley Transit Company, at a cost of about \$250,000, has just taken 8 miles of its track off the public highway and eliminated more than sixty bad curves, thus reducing its track mileage only 1.6 miles but its operating time seventeen minutes. Between two certain stations the running time was reduced from twelve to five minutes. When it came to a question of going outside the towns, the cry was heard on every hand that the traffic would be killed, and mass meetings in protest were held in various municipalities. In every instance, however, where the tracks were taken away from the center of the town, the business has almost doubled. In these cases of abandonment of track in towns, the company established at a central point standard stations, with night and day agents and combined passenger, freight and express offices.

A system of stop numbers for local stops is more than essential in interurban operation, as it defines definitely every stop and facilitates the loading and unloading of passengers. The condensing or elimination of stops between towns forms a great factor in cutting down time. Although the public will at first think it cannot get along without such stops, it will enter into the spirit for faster service and the complaints will die a natural death. The Lehigh Valley Transit Company went over 45 miles of track and abolished twenty-two

stops. The letters and petitions received at that time would make the archives of the library at Washington blush with shame, but the company made it a point all along the line, through publicity of various kinds, to bring the public into a close appreciation of and co-operation with the work being done to give faster and more up-to-date service. The increased traffic and the building-up of the entire length of the lines has more than compensated this act.

The operating features also constitute a very potent factor in the time unit. The operation of two or more car trains minimizes the units in operation, getting away from the old system of operating two or three sections to each train, which in itself consumes a great deal of unnecessary time and has serious features from the accident standpoint. The operating of every other train as a limited and every other train as a local is working out well in many sections of the country. A service of less frequency works to as good advantage with less cost of operation, and the limited service, stopping only in municipalities, gives a double service where it is most needed. The Lehigh Valley Transit Company, in the inauguration of its through limited service from Philadelphia to Allentown, has carried out these ideas in a most satisfactory manner. The through limited trains cover a distance of 56 miles in one hour and fifty-seven minutes, and only nine regular stops and two flag stops are made. The local trains make all stops. Both classes of service operate hourly, thus giving to the municipalities a half-hour service.

The laying out of the operating schedule so that all local trains may have sufficient time, under various traffic conditions, to clear the limiteds at the passing points, is a problem to be worked out by the dispatching department. If the limited service is kept on schedule at all times, the local service as a natural consequence will also be so kept, and the greatest advertising feature of any service, namely, "Always on the dot," can be very easily maintained. It might be mentioned that in connection with the limited service, the Lehigh Valley Transit Company charges an excess fare of 10 cents for any traffic that originates or ends between the terminals. For traffic that originates or ends at either of the terminals, no excess is charged. This is done to relieve the limited service from local traffic, and the public at large is keen to appreciate this high-grade service and is willing to pay for its benefits.

Not only does the passenger service enter into the conservation of the time, but the freight and express service forms an equally important factor. The interurban roads are in the best of positions to solve the problem of quick delivery of perishable market garden products to municipalities. The Lehigh Valley Transit Company last year handled as one commodity alone about 42 tons of mushrooms, which class of shipment demands the best of service. This business was taken from one of the old-line express companies on account of the electric railway facilities for landing it in Philadelphia to make connections with Northern and Southern points in the quickest manner. For this traffic the company used the baggage compartment of the limited cars, operating every hour, so that the time factor would be reduced to a minimum. Another class of perishable shipments are the products of the Florex Greenhouses, located on the company's line. These greenhouses supply the Eastern markets with "American Beauty" roses and with carnations, and the company gets the major part of this business because it can place these goods in Philadelphia more quickly than the steam roads.

The matter of farm products is also entering very largely into the time factor of interurban lines. At

present there are no municipal markets in Philadelphia, but the present administration has lately taken up the question of the introduction of markets and has called the interurban people into their conferences, and the lines are affiliating themselves with the city government. The farmers are interested in the organization of a farmers' association or common pool, this pool to hire a representative in the municipal markets to whom goods may be shipped for disposal. The interurban lines are the ones that are going to accomplish this work, and the factor of speed plays an important part in the success of their endeavors.

In figuring out the various problems for the conservation of time, an interurban line should not for one moment neglect or in any way disregard its local riding. In all its arrangements it should protect the local traffic with the view that this, rather than being interfered with in any reorganization scheme, shall be materially benefited by a better and more efficient service.

It must be remembered that in all plans for the reduction of time, the interests of safety must be protected. The placing of tracks upon private rights-of-way, the elimination of curves, the establishment of definite stops, adequate protection of crossings by crossing bells and signs, the installation of automatic block signals, either track or overhead, and the physical examination of employees are all essential factors which enter into safety in operation. Along with its other safety work, the Lehigh Valley Transit Company has placed bells as well as warning signs at all dangerous crossings along its line, and at the present time is erecting warning signs 300 ft. from the crossings.

#### SOME PRACTICAL WORKMEN'S COMPENSATION QUESTIONS

BY LEFFERTS S. HOFFMAN, GENERAL ATTORNEY PUBLIC SERVICE CORPORATION OF NEW JERSEY, NEWARK, N. J.

The first question arising in connection with the Pennsylvania workmen's compensation act, effective on Jan. 1, 1916, is as to the advisability of accepting its compensation provisions. If the elective system of compensation is not accepted by the employer, and an action is brought against him by an injured employee, the three principal defenses of employee's negligence, assumption of risk and fellow-servant responsibility, which have heretofore been of great assistance in defending such damage suits, are taken away. With these defenses gone, the matter of establishing the employer's liability to respond in damages for injury by accident, on account of which a suit could be maintained at common law, would be a comparatively easy matter, particularly when it is considered how many accidents to employees are caused by the carelessness of fellow employees, the liability for whose acts is now placed upon the employer. This same question as to whether or not the act should be accepted arose with the Public Service Corporation of New Jersey under the law of that State, and after a thorough consideration of the matter, the elective compensation system was adopted.

#### EMPLOYEES' MEMORANDA OF ACCEPTANCE OF COMPENSATION

Having decided to adopt this system, the company drew up a memorandum for the employees to sign, showing whether they rejected or accepted the elective compensation provisions of the act. The Pennsylvania act provides, in Section 302, that every contract of hiring made after Dec. 31, 1915, and every contract of hiring renewed or extended by mutual consent, expressed or

implied, after that date, and every such contract in operation on Dec. 31, 1915, shall be conclusively presumed to continue subject to the provisions of the elective compensation system, unless either party shall have notified the other in writing to the contrary. As a copy of the notice has to be filed with the bureau of workmen's compensation of the Department of Labor and Industry, it would seem as though it were not necessary to have proof other than the files of the bureau of the status of the employees toward their employers in respect to the act.

In the section noted, however, there is a proviso to the effect that the provisions "shall not be construed as to impair the obligation of any contract now in force." If this raises any serious question as to whether or not it applies to the ordinary contract of hiring, then it would be advisable to obtain such signed memoranda from the employees as above described for the purpose of eliminating any question as to the application of the proviso to any particular case. On the other hand, the obtaining of such signed memoranda is quite an undertaking, gives rise to many discussions between the employees and the company as to the advisability of employees accepting or rejecting the provisions of the act, necessitates among employees a campaign of education relating to the act, and may, in view of the provisions of the act, prove to be more trouble than it is worth. Very likely the proviso in the section refers to hiring for definite lengths of time extending beyond Dec. 31, 1915, but it can easily be seen how the question might arise with many ordinary employees as to whether or not their contracts now existing did not extend beyond that date.

#### EFFECT OF BENEFIT ASSOCIATIONS

Section 204 provides that the receipt of benefits from any association or fund shall have no effect upon the operation of the law, and a release executed in consideration of such benefits shall be void. If any company has an association from which benefits are derived by the employees, this matter will require consideration.

The Public Service Corporation of New Jersey has a welfare plan, under which certain allowances are made to employees during a limited period of incapacity caused by accident or sickness, and a certain sum is paid to their families in case of their deaths. This plan was in operation prior to the passage of the workmen's compensation act of New Jersey. When this act was passed, however, the company modified its welfare plan so that the employees would not be paid under both systems. A rule was passed by the welfare committee to the effect that in the event of employees being incapacitated by an accident whereby the company was obligated to pay them under the workmen's compensation act, no payment would be made under the welfare plan unless the amount which they became entitled to under the workmen's compensation act was less than they would be entitled to under the welfare plan. In this event the company would make up to them the difference.

If any Pennsylvania company is in a similar position and intends taking a similar course, it would be well to bear in mind that in making the payments the first care is to see that the payments are made in accordance with the workmen's compensation act and in discharge of the liabilities thereunder, and that any balance that might be due under any other plan is paid to the employees as something entirely separate from the act. The New Jersey courts have held that any payment in excess of the amount called for by the act is a mere gratuity or gift, which cannot be recovered and to which no credit

can be given the employer. This is a matter of no great importance, but it sometimes has happened that under a mistaken view of the act the employee has each week been paid a larger sum than he was entitled to, and when disputes have arisen as to the length of time the employee was entitled to compensation, he has taken the matter to court. Perhaps he sustained the contention that he was entitled to payments for a longer period than his employer thought, but the court also found that he was entitled to payment at less than the rate at which the employer had been paying him. In such a case, the court has held that any excess payments that may have been made are mere gifts, and that the employer shall continue to pay at the rate fixed by the court during the period determined by it, with no credits for excess payments theretofore made.

#### LENGTH OF MEDICAL ATTENTION

In Section 306 of the Pennsylvania act there is a provision to the effect that during the first fourteen days no compensation is payable but that surgical, medical and hospital service, medicines, etc., shall be supplied. While, of course, it is quite necessary that the law should put a limit upon the time during which such service must be supplied by the employer, in the practical operation of the law it will many times be wiser to supply medical attendance beyond the mere statutory period of two weeks, for the reason that it is to the interest of both the employer and the employee for the injured man to recover and be able to return to work as speedily as possible. If the employer ceases promptly at the end of two weeks to furnish medical attention, it will happen in many instances that the employee will fall into the hands of unscrupulous or incompetent physicians and his incapacity will be unnecessarily prolonged. The Public Service Corporation of New Jersey does not hesitate to furnish free medical attendance for a long time after the expiration of the two weeks, not only because it feels that by so doing it actually saves money which it would otherwise be obliged to pay out on account of the prolongation of the period of recovery, but also because under the welfare plan the company has enough interest in its employees to see to it that those injured while in its employ should receive competent medical and surgical attention.

Sometimes employees are suspicious of treatment by doctors furnished by the company, but cases where employees refuse the medical and surgical service supplied are getting more and more rare. If Pennsylvania companies adopt this plan, there may at first be doubts and suspicions in the mind of the employees in using service which the law does not compel the companies to furnish, but when it becomes apparent that they are not trying to put the employees in a false position or to make testimony for use in the event of a trial, little difficulty will be had in the matter.

#### INJURIES CAUSED BY THIRD PARTY

Section 319 of the act provides that where an employee in the course of his employment is injured by a third person, the employer shall be subrogated to the rights of the employee against such third person. In order to preserve all the rights under this section, a company should, on the occurrence of an accident caused by the third person, immediately give notice of the occurrence to such third person, making a claim against him by way of subrogation. Otherwise the third party may settle with the employee on the assumption that the injured person was not an employee of anyone, or, at the time of the accident, was not in the discharge of his duties as an employee.

The person causing an injury to the employee of another could, in the absence of notice of the employer's rights, settle with such employee so as to relieve himself of any further obligation, irrespective of the provision of the statute. In fact, if the general principles of subrogation are to be applied, no reason is apparent why a settlement cannot safely be made with an injured person who is acting in the employ of another when injured, provided the settlement is made before the employer makes his settlement with the employee, as it is a general principle relating to subrogation that there can be no subrogation until the one who claims that right has discharged his obligation in full.

Of course, if a fair settlement is made by the third person with the employee, no harm is done the employer, because the amount paid the employee can no doubt be credited against the amount which the employer is obligated to pay him under the statute. Thus the chief object in giving notice would be to prevent settlements between the employee and the third person which are entirely inadequate and insufficient to offset the amount which the employer would have to pay under the statute, and also to prevent, so far as possible, settlements between the injured employee and the third person being kept secret.

The question of strict subrogation, as applied to the New Jersey act, has not arisen because this act provides that in the event of an employer wishing to claim reimbursement from a third person causing an injury to one of his servants, he shall file with the third person a statement of his claim. Until the statement is filed, the injured employee and the third person causing the injury are left free to act as they see fit regarding the employee's claim.

#### AGREEMENT UPON COMPENSATION

Section 410 of the Pennsylvania act provides that the employer and employee, or his dependents, may agree upon the compensation payable under the act. This agreement would be valid and binding, however, only when finally approved by the board. In the practical administration of the act, however, it will be found that such an agreement is seldom, if ever, necessary. The New Jersey act has a provision that a company may agree with its employee as to the amount of compensation due, but I do not know of a case where the Public Service Corporation of New Jersey entered into such an agreement. It has been found that the easiest way to administer the law is to begin payments in accordance with the law's provisions and continue them for such a period as the law provides. Where the period is indefinite, the company continues them until in the opinion of its physicians the employee is well and able to go to work. Very seldom, if ever, does a dispute arise as to when that period arrives, but if it does the company endeavors to get together with the employee and satisfy him. If he cannot be satisfied, he is left to his remedy by petition to the court.

In the New Jersey act, however, the agreement may be opened after the expiration of one year, so that it might not be of so much value as would be an agreement under the Pennsylvania act, which appears to make the agreement final, provided it is approved by the board. It is so rare that any disagreement as to the amount and the period during which compensation is payable arises between the employer and the employee, that it very likely would not be worth the time and effort spent, and the discussion which would necessarily follow, to procure an agreement with employees as to the amount of compensation to which they were entitled under the law. A possible exception would be special cases, as, for instance, death cases, where no doubt it

would be well to fix by inclusion in a binding agreement the names and ages of dependents, their relationship to the decedent, etc.

#### METHOD OF INSURANCE

The Pennsylvania act provides that companies must insure in the State workmen's insurance fund, or in some insurance company authorized to insure such liability, unless the employer is exempted by the bureau on an application showing his financial ability to pay compensation. This choice of method constitutes the most important questions to be decided. In New Jersey there is no State fund, but the New York law provides for such a fund. Where it is necessary to be insured, the question of insuring in the State fund or insuring in an insurance company is one depending merely on the cost and on the exercise of care in selecting an insurance company.

In insuring in the State fund the employer is relieved from all liability to pay compensation to its employees. In insuring in an insurance company, however, there is the possibility of the insurance company not being able to pay, in which event the employer would nevertheless have to make the payments required by the act. It therefore is important to look into the financial standing of the insurance company, if this method is adopted, for the liability to make payments in particular cases may be continued for a period of sixteen years. The law provides that the payments in death cases shall cover a period of 300 weeks, but if there are children of the decedent under sixteen years of age the payments shall continue until such children arrive at the age of sixteen years at the rate of 15 per cent for one child and 10 per cent for each additional child, but not in excess of 50 per cent. It appears by this that in the case of a child born at about the time of the father's death, or in the case of a posthumous child, the law continues to operate for the benefit of that child for a period of sixteen years. A company must, therefore, consider the future of any company with which it may insure.

What appears to be the most important question to be considered in connection with insurance, is whether the company cares to adopt either the State-fund or the insurance-company method, or be exempted from such methods and thus get the benefits of administering the law itself. The greatest benefit of compensation laws is the taking away of causes of friction, annoyances and misunderstandings between the employer and the employee. The Public Service Corporation of New Jersey has found in its experience of about four and one-half years that the greatest amount of benefit of this nature can be obtained through the administration of the law by the employer himself, for when the money is paid out by the employer his agent comes in personal contact with the injured employee, either at the paying office of the employer or at the home of the employee, and thereby can keep in close touch with him and his family and show a personal interest in their welfare. The benefit that a company derives from such close personal communication between the injured employees with their families and its executive officers is invaluable in preventing an unrest or antagonism between employer and employee which otherwise might well exist.

The point is that in insuring in the State fund a company is depriving itself of all benefit to be derived from the personal administration of the law, as the payments, when made by the State, must of necessity be more or less of an impersonal nature. If a railway insures in an insurance company, it should be provided that the railway itself, as employer, should have the right to administer the fund which is supplied by the insurance company under its contract.

#### STEAM RAILROAD ELECTRIFICATION

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In general it may be stated as an accepted fact that very few railroads will ever introduce electric operation unless they can see a profit resulting from it. Of course, some companies may be forced to electrify by city councils, a method that is greatly to be deplored; others may have certain portions of their line electrified to avoid the dangers and losses incident to smoke in tunnels or to increase the capacity of a terminal or congested division; and still others may desire to utilize cheap water power instead of paying exorbitant amounts for coal. When all these lines are electrified, however, there will still remain a large part of the railroad mileage in this country to be handled by the steam locomotive, which, by the way, is not the weak and inefficient machine that it was twenty years ago. Indeed, the high-speed passenger locomotive of to-day is capable of developing 3000 hp. at 70 m.p.h. for several hours at a time, and no electric locomotive has yet been built to equal this performance. Nevertheless, there is no doubt in the mind of anyone that this, or even greater power, can be easily supplied by an electric locomotive if such a machine is ordered.

The electric locomotive must make a large part of its showing in its incidental advantages, and one of the most important of these is that it may remain in service continuously for a week at a time, while the steam locomotive has to spend a large part of its time in the roundhouse. Potentially, the electric locomotive is able to start out with a train and take it clear through to its destination, whether this is 100 miles or 1000 miles away. In the future, annual mileages will be obtained with electric locomotives that are to-day undreamed of with steam machines. Electrification is going to result, therefore, in a more efficient handling of transportation. An electric locomotive designed for a normal speed of 14 m.p.h. and making a daily mileage of only 75 or 100 is not working up to its capacity in any respect, and a railroad president properly can, and no doubt will, inquire why the traffic cannot be arranged so as keep engines at work making 200 or 300 miles per day.

An incidental advantage resulting from the electrification of large terminals will come from the greater value of real estate owned by the railway companies. The cost of a right-of-way in a large city is enormous, but if the tracks are electrified, the entire area can be covered with buildings of all kinds. Covering the tracks with warehouses will be of particular advantage, because in such a case it will be possible to raise carloads of freight on elevators to higher floors in the warehouse, where the cars can be unloaded promptly or reloaded whenever the goods have been sold. The cost of handling freight will thus be enormously reduced, and demurrage charges will be eliminated.

Many other incidental advantages will be found when railroads are finally induced to electrify. They cannot appear all at once, and the best results from electrification cannot be obtained unless all of the details are worked out with the greatest care. I am, therefore, very much opposed to forcing the electrification of terminals before the railroads are ready for it. The cost of electrification is enormous, and the railroads must either save enough money in the cost of operation to pay for the interest on the investment or else the freight and passenger rates must be increased. I am a thorough believer in electrification, but until the best system for electrification is more definitely decided progress will be slow. Enough has been done, however, to show

that there is no class of service in the United States that cannot be handled at least as well by electricity as it is by steam.

### WORKMEN'S COMPENSATION IN PENNSYLVANIA

BY HARRY A. MACKEY, CHAIRMAN WORKMEN'S COMPENSATION BOARD, HARRISBURG, PA.

The compensation plan in Pennsylvania is an optional one. The first question that an employer must decide between now and Jan. 1 next is whether he will accept or reject compensation. In order to reject the law it will become necessary to notify the employees to that effect in the manner prescribed by the act, file a proof of the same with the board at Harrisburg and then wait for the consequences. When Article III of the act is rejected, if an employee is injured under such circumstances that he can allege negligence with sufficient evidence that it will become a question for the jury, the company will not be able to set up contributory negligence, risk of employment or negligence of a fellow-employee. The only defense will then be a reckless indifference to safety appliances provided by the employer, or intoxication, both being questions for the jury. It seems, therefore, that not only the spirit of the times but a desire to protect their own interests would impel street railways to adopt compensation. In doing this they really have nothing to do, for silence will be considered acceptance.

After having decided to accept the act, then companies are brought face to face with the question of insurance. The compensation board does not advocate any particular form. The State is a wide field for competition. Many insurance companies are in the field, all having complied with the laws of the State, and all are entitled to fair play. At the time this act was passed the Legislature created two new means for the employer to effect insurance. Where twenty or more employers employ 5000 or more employees and have accepted the provisions of the act, they may form an incorporated employers' mutual liability insurance association for the purpose of insuring themselves. There is also the State insurance fund. Probably all these forms of insurance have their individual advantages.

There has been a very lively interest excited throughout the State because of the State insurance fund feature. The sponsors for the act never intended that it should monopolize the business or that it should be a serious obstacle in the way of good and lucrative business for the other insurance companies. It is intended as a regulator of rates—in fact, a State-managed mutual company. It has its limitations and its advantages. It cannot, under its act of creation, issue a policy to employers for complete coverage, indemnifying employers from liability to the general public, but it can give complete immunity to its subscribers because of employees injured during the course of their employment, and under such circumstances that there is a liability created under the workmen's compensation act. One of the advantages of State insurance under the act and the rules of the board is that subscribers are absolutely immune from the filing of a lien against their real estate for claims arising under the operation of the compensation law.

The act also provides that companies can make application upon forms furnished by the board, for the right of self-insurance. If they satisfy the board of their financial responsibility, it can place them upon the exempted class of those who are allowed to carry their own insurance, or it can make such orders as it thinks will inconvenience the companies the least and furnish their

employees with absolute and positive security against losses from injuries by accidents.

It is very essential that, having decided to accept compensation, the companies should determine the question of insurance and act upon it. If they do not do so and are notified that it is their duty to insure, and then fail after thirty days' notice thus given, the injured employees have the option of either suing at common law, with the three old defenses stricken out, or of claiming compensation under the act, just as they think their best interests will be served.

### C. E. R. A. Accountants Meet in Detroit

Proceedings of Sessions Held on Dec. 7 and 8—Abstract of Paper on "Shop Orders"

The twenty-eighth annual meeting of the Central Electric Railway Accountants' Association was called to order at 1.30 p. m. on Dec. 7 at the Hotel Statler in Detroit, Mich., by President H. B. Cavanaugh, auditor Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. About twenty-five members from Indiana, Ohio and Michigan were present, and members in other States in Central Association territory were represented by telegrams.

After the reading of the minutes of the previous meeting held at Indianapolis last June, President Cavanaugh called attention to the activities of the last year and the impression on general railroad accounting being made by the association. An abstract of his presidential address was published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 11. The executive committee in its report presented the names of four new applicants for membership, who were unanimously elected.

W. H. Forse, Jr., secretary-treasurer Union Traction Company of Indiana, Anderson, Ind., then read a paper on "Depreciation and Appreciation," an abstract of which was published in the issue of Dec. 11. After a two-hour discussion of this paper it seemed to be demonstrated to all present that there was little hope of arriving at any definite rate to be used in accruing the charges for depreciation at the present time or in the near future. The many angles of the subject and the varying physical conditions of the companies were held to prohibit the association from taking any definite action on this subject. It was the consensus of opinion, however, that the Interstate Commerce Commission should furnish more definite instructions. One phase of the discussion related to the blanks furnished by the commission and used by the companies in making a report for the fiscal year ended June 30, 1915, and it was stated that these blanks seemed to fit in very well with the classification of accounts for electric railways issued in 1914.

The standing committee on passenger and freight accounting reported that it had nothing new to present. Only one question had arisen since the last meeting, and the answer to this would be made at a later date. The committee on forms presented a report stating that the filing system authorized at the June meeting had been installed, and an index of all forms on file had been sent out by the secretary of the association to all its members. It was requested that members forward any new forms. A nominating committee of three members was then appointed by President Cavanaugh, after which the announcement was made that Irwin Fullerton, auditor Detroit (Mich.) United Railway, had invited the delegates to a dinner at the Fellowship Club. The invitation was accepted with a rising vote of thanks.

The second session was called to order at 9 a. m. on Dec. 8, and it was announced that a trip to the Ford

Automobile Company's plant would be made at the end of the session under the auspices of the Detroit United Railway, as well as a trip to the freight stations and other property of the latter company if the members desired to go.

The first paper of the morning was on the subject of "Accrued Accounts," by A. E. Dedrick, auditor Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, which was abstracted in the issue of Dec. 11. In the discussion on this paper the most important item covered was the taxes accrued account. The Ohio tax law was quoted and its requirements discussed. This law and its application seem to be not very well understood by either the companies taxed or the tax commission. Other papers of the morning were that by B. H. Jacobs, assistant auditor Cleveland (Ohio) Railway, on the subject of "Shop Orders," which is published, in abstract, on this page, and that by E. L. Kasemeier, auditor Ohio Electric Railway, Springfield, Ohio, on the subject of "The Journal Entry Tickler," which was published in abstract form in the issue of Dec. 11.

The report of the nominating committee was unanimously accepted by the delegates, and officers were elected for the coming year as follows: President, F. T. Loftus, auditor Indianapolis & Cincinnati Traction Company, Rushville, Ind.; first vice-president, J. B. Hooper, auditor freight accounts Detroit, Monroe & Toledo Short Line Railway, Detroit, Mich.; and second vice-president, T. P. Kilfoyle, auditor Cleveland (Ohio) Railway. The executive committee for next year consists of the following: Oren A. Small, auditor Benton Harbor & St. Joseph Railway & Light Company, Benton Harbor, Mich.; A. C. Van Driesen, chief accountant Toledo Railways & Light Company, Toledo, Ohio; A. E. Dedrick, auditor Mahoning & Shenango Railway & Light Company, Youngstown, Ohio; P. C. Reinking, auditor Fort Wayne & Springfield Railway, Decatur Ind., and B. H. Jacobs, assistant auditor Cleveland (Ohio) Railway.

After the meeting of the delegates had been adjourned, the new executive committee held a meeting at which A. L. Neereamer, secretary Central Electric Railway Association, was unanimously re-elected for the year as secretary of the Accountants' Association. Mr. Neereamer is also treasurer of this body, by virtue of being treasurer of the parent association, in accordance with the revised constitution and by-laws. It was decided that the June meeting would be held in Toledo at a time to be determined later.

### SHOP ORDERS

BY B. H. JACOBS, ASSISTANT AUDITOR CLEVELAND (OHIO) RAILWAY

The shops of the Cleveland Railway have had to assume an exceptionally important part in the rehabilitation of a property that was run down to a very low state of upkeep by several years of continuous municipal warfare waged against it. The part played by the shops in the reconstruction and remodeling of obsolete and inefficient cars, the installation of fare boxes and changes in platform and doorways incident thereto, alterations in motor cars made necessary by the use of trailers, and the construction and contributing construction of additional rolling stock, pertinently suggested the need and the value of more shop-cost details. More recently it has also been found advisable to keep an account of the cost of repairing cars damaged in collisions separate from the account for repairs made necessary by the ordinary wear and tear resulting from car operation and use.

The accounting department has attempted to meet and control these conditions by the use of shop orders. On receipt of advice from the general manager that alterations are to be made in a certain lot of cars, or that an order has been placed for a stated number of new car bodies, the installation of the electric equipment, air brakes and other accessories thereon to be done in the shop, the master mechanic issues a shop order with the proper consecutive number. This outlines the nature of the alteration or character and extent of the construction work required, together with such other instructions as may be deemed necessary. Copies of the order are sent to the foreman of each department likely to have a hand in the work prescribed, and to the auditing department.

From then on the job is known as "S. O. No. —," and all invoices, time reports and requisitions for material used in connection therewith show distribution to the particular order. When such orders included work to be done on both the car bodies and the electrical equipment as well, the order is made to read, for example, "S. O. 112 car bodies, 112a electric equipment," to enable the auditing department to make the proper distribution of charges, when the various shop orders are charged out at the end of each month to the maintenance or capital accounts that are affected by the work accomplished.

The use of letters in this manner provides a flexible system that will admit of almost unending details. It has not been found practicable, however, to go into detail necessitating the use of more than three or four letters except in one or two instances. Four letters provide the necessary segregation of expenses, such as those in connection with the bodies, the motors, the air brakes and some special accessories in the cost of installation of which the management may be especially interested.

An itemized account of every charge to each shop order is kept in a shop-order ledger, from which a summary is carried monthly to the appropriate capital and maintenance accounts. Only the total amount of the shop order is transferred to the corresponding account in the betterment ledger, in posting from the shop-order ledger, but such totals are supported by a summary sheet immediately following each account, giving the quantities as well as the amounts of the various parts for which the charges were made. Thus when a shop order is complete, the summary sheet affords a very ready means of discovering any discrepancies in either quantities or amounts charged, and provides, with other things, a complete inventory of all the parts involved in the carrying out of the order.

### Chicago Surface Lines Club

The first dinner meeting of the Chicago Surface Lines Club was held at the Morrison Hotel on Dec. 14, 1915. Two hundred and sixty members of the club attended and addresses were made by H. M. Webber, superintendent of relief and safety Chicago Telephone Company; W. A. Sauer, assistant superintendent of accounting department Peoples' Gas, Light & Coke Company; George B. Foster, assistant to vice-president Commonwealth Edison Company, and E. J. Blair, electrical engineer Chicago Elevated Railways. L. A. Busby, president Chicago Surface Lines, also addressed the club, and incidentally announced the fact that the membership had now exceeded 600. A. R. Peterson, trial attorney Chicago Surface Lines, acted as toastmaster. The dinner was purely a social affair, and the speakers from the other Chicago utilities companies outlined the work their employees' clubs were doing.

## St. Paul Locomotive Tests

**Two of These Locomotives Have Handled Larger Trains than Three Steam Locomotives at Speeds More than 50 Per Cent Higher**

Details of the tests upon the electric locomotives for the Chicago, Milwaukee & St. Paul Railway, which have been conducted on the first electrified division of that railroad between Three Forks and Deer Lodge, Mont., show that the electrical equipment has met every expectation of its sponsors. The tests began on Dec. 2, shortly after power was cut in on the line and on Dec. 6 two of the electric locomotives took a freight train weighing 2800 tons from Butte to Piedmont across the continental divide, some 16 miles east of the former city, making the total distance of 39 miles in two hours and fifteen minutes. This run includes an up grade of approximately 10 miles in the vicinity of the Janney substation with maximum gradients of 1.66 per cent, and a down-grade of 21 miles on the eastern slope of the continental divide with maximum gradients of 2 per cent. This train made an average speed up grade of 14 m.p.h., and it descended the 2 per cent grade into Piedmont at a practically uniform speed between 17 m.p.h. and 18 m.p.h., the average speed for the entire run being 17 m.p.h.

On Dec. 8 a competitive test between the electric locomotives and steam engines took place under the observation of a large party of officials of the Chicago, Milwaukee & St. Paul Railway, including A. J. Earling, president; C. A. Goodnow, vice-president; R. Beeuwkes, electrical engineer, and J. J. Murphy, superintendent, together with A. H. Armstrong and W. B. Potter of the General Electric Company. In this test a train of forty-eight cars, aggregating 3000 tons in weight, was made up in Butte and run over the mountain to Piedmont with two electric locomotives. The inspection party observed the test from Janney substation, and at that point the train hauled by the electric locomotives was operated at a speed of 16 m.p.h., apparently without taxing the power of the electric machines, the rating of the two engines on the 1.66 per cent grade being 3700 tons based on a rolling friction of 6 lb. per ton. Following the electrically-operated train was another in which there were thirty-seven cars approximating 2200 tons in weight, and this was hauled by three steam locomotives, two of which were of the Mikado type, with the third, a Mallet locomotive, acting as a pusher. This train was able to ascend the hill at a speed of only about 10 m.p.h., in marked contrast to the electrically-operated train that had preceded it.

The special train for the party of inspection was made



ST. PAUL LOCOMOTIVE TESTS—SPECIAL TRAIN AT JANNEY SUBSTATION

up of six Pullman cars and this also was drawn by an electric locomotive. It was operated over the divide to Piedmont substation and then ran back to Janney, going up the 2 per cent grade west of Piedmont with greatest ease at a speed of about 22 m.p.h. During the return to Butte the train was operated over the relatively level track approaching that city at a rate of about 31 m.p.h. No attempt at great speed was made, however, because the engine was geared for freight service, none of the passenger engines having yet been delivered. The latter engines are expected to make 60 m.p.h. with an 800-ton trailing load, and judging from the smooth-riding qualities of the freight engine in the test outside of Butte, it is said to be certain that no difficulties will be experienced at the higher speeds.

No troubles of any kind have appeared in connection with the operation of the locomotives, either in regard to their ability to haul trains up grade or in regard to the operating features of the regenerative system on the down grades. In consequence, the four locomotives that are on the 113-mile electrified division, which is at present completed between Three Forks and Deer Lodge, have been placed in actual service and are doing pusher work on the grades to help out the steam locomotives. During the month of December three and possibly four more locomotives will be delivered, and if the railroad company has received a total of eight freight locomotives by Jan. 1, electric freight transportation between Deer Lodge and Three Forks will be established during the first week of the new year. The initiation



ST. PAUL LOCOMOTIVE TESTS—PASSENGER TRAIN ON 2 PER CENT GRADE WEST OF PIEDMONT

of electric operation of passenger trains will depend upon the delivery of the passenger locomotives, which are similar in every respect to the freight engines except for the gearing. However, it is expected that shipments of these units will be made some time after the first of the year.

In connection with this it is of interest to note that some time ago the purchases of steam locomotives for the divisions under electrification were limited by the railway company. In consequence, there is a scarcity of steam motive power at the present time which is being supplied by the electric machines, and this fact would indicate that the steam locomotives which are to be retired are going to be credited to the electrification at their full value. Another item of interest in connection with the electrification was recently made public in a speech delivered at the inauguration of electric operation by John D. Ryan, who is one of the directors of the Chicago, Milwaukee & St. Paul Railway. In this Mr. Ryan said "it was the foresight of the management of the St. Paul road that made its route run close to those water powers and made possible the development of them. The fact is that the development of these great water powers of Montana was possibly largely through the practical assurance that the St. Paul road would take a part of that power. It was through this that we have made possible for all, little and big, to secure the best and cheapest power. It makes no difference whether they use 1 hp. or 10,000. They are able to get it because of the railroad taking this power.

### Cost of Motor Buses

Figures Based on Actual Operation of Motor Bus Line in Richmond, Va.

Statements have been made from time to time in this paper about the fleet of motor buses operated last summer in Richmond by the Virginia Railway & Power Company. This company owns the electric railway system in Richmond and found last spring, in common with many other companies, that its receipts were being adversely affected by a large number of jitneys. The company decided if the jitney was a real improvement in methods of city transportation it was in a better position than anyone else to conduct this service. Consequently, it purchased some forty cars in April and operated them on regular schedules in that section of the city where jitney service was being rendered. The test with these cars showed that the business could not be conducted without a loss, and it was discontinued in September. Through the courtesy of C. B. Buchanan, general manager Virginia Railway & Power Company, the following statement of jitney operation is published:

STATEMENT OF RICHMOND JITNEY OPERATION, APRIL 17, 1915, TO SEPT. 14, 1915.

|                             |              |
|-----------------------------|--------------|
| Gross earnings .....        | \$30,501.28  |
| Taxes .....                 | \$671.00     |
| Operation .....             | 24,043.79    |
| Maintenance .....           | 9,758.70     |
| General expense .....       | 1,856.77     |
|                             | *\$36,330.26 |
| Deficit .....               | \$5,828.98   |
| Bus-hours operated .....    | 62,080       |
| Earnings per bus-hour ..... | \$0.491      |
| Expenses per bus-hour ..... | \$0.585      |
| Loss per bus-hour .....     | \$0.094      |

\*Expenses do not include any charges for depreciation, or for rent of garage.

As will be noticed, the earnings per bus-hour were less than the operating expenses, not including depreciation or rent for the garage. The company first undertook to keep a record of its expenses on the bus-mile basis but had to abandon this plan on account of numer-

ous errors in the mileage recorders, so that the statement was prepared on the bus-hour basis. The average miles per hour made by the buses were approximately 12 miles. The company owned the garage where the buses were stored, and in the statement given above no allowance is made for the rent of the garage. No attempt was made to estimate the depreciation on the buses, but Mr. Buchanan says, "It was very great for the short time they were operated." The buses used were five-passenger touring cars of the usual kind. Part of them were Fords and the others Briscoes.

## COMMUNICATION

### Chicago Smoke Abatement Report

WATERTOWN, N. Y., Dec. 14, 1915.

To the Editors:

The synopses of the Chicago smoke abatement and terminal electrification report, published in the issues of the ELECTRIC RAILWAY JOURNAL for Dec. 4 and 11, while omitting details, are nevertheless complete enough to demonstrate the cosmic dimensions of the whole field of inquiry, and the conscientious and scientific manner in which the task was performed by the engineers, who did the real work. Local atmospheric and combustion conditions have been examined, every railroad electrification in the world analyzed, and the various proposed substitutes for the steam locomotive subjected to engineering scrutiny. It would therefore seem that engineers, at least, can accept conclusions which have been reached with such painstaking care, being based upon a wide survey of the state of the art. There is an impression that the people of Chicago have been encouraged to believe that if the steam locomotive could be banished from their railroad tracks, the city would be relieved from the stigma of atmospheric pollution for which it has so long been proverbial. The writer recently saw a clipping from a Chicago newspaper's editorial column, arguing seriously that because railroad electrification had succeeded elsewhere it would be bound to succeed in Chicago, and cynically impugning the good faith of the committee and the railroads for undertaking the investigation of the matter with a negative answer as a foregone conclusion.

The engineering fraternity, however, is quite prepared for a presentation that shows the problem to be a many-sided one, and can appreciate the difficulty of trying to convince the molders of public opinion of the real nature of the disease and the proper course of treatment for its eventual cure.

The impression one gains from the synopsis is that of inclusive breadth of treatment, applied to a problem that could be stated about as follows: What is the railroads' share of Chicago's atmospheric pollution, and what will it cost to substitute smokeless for smoky railroad operation? And the answer has propounded a still harder problem, how to remove the causes, other than steam locomotives, that produce 95 per cent of the atmospheric pollution? That which interests us primarily is the engineering aspect of electrification as a substitute for the steam locomotive.

Here, two things stand out prominently; first, the economic futility of electric motive power when applied on a tremendous scale to the Chicago terminal system as a whole, under conditions where it is not a physical necessity for train haulage; second, the mechanical inadequacy of the proposed self-propelled substitutes.

Electrical engineers will be impressed not only by the heavy cost of electric rolling stock as given in the estimates, but also by the heavy cost of delivering the electric power to the rolling stock; and are also re-

minded that the full benefits of electrification involve such radical changes in layout that the non-electrical features cost nearly the same as the electrical.

Using round figures, from the published summaries, the entire cost is about \$274,000,000, of which only \$82,000,000, net, is for new smokeless rolling stock. About \$59,000,000 must be spent on the power supply system and related accessories. This is an addition of about 72 per cent to the net cost of new rolling stock. On top of this comes \$37,000,000 for transplanting the locomotive terminal facilities to the outer edge of the electric zone—this item is not peculiar to the electric system but would have to be provided for any other smokeless substitute. Finally, there is the \$96,000,000 "precipitated" charge, required to get the full benefit of all the rest of the money. The last two items, which are entirely non-electrical, amount to 48½ per cent of the whole.

The switchyard problem undoubtedly has inherent peculiarities which make its electrification more expensive or less remunerative than straightaway trunk line or suburban electrification, though of course such considerations are not self-evident to newspaper writers, and, in fact, can only be properly grasped by technical experts after careful analysis. For instance, it has been an accepted principle of railroad electrification that it can only succeed economically, when the traffic is sufficiently dense. On the face of it, this means train-miles per mile of track as a unit of comparison. The synopsis does not elucidate how the annual saving by electric operation over 3500 miles of track comes out at so low a figure as \$2,333,000; but it may well be that the actual car-miles or train-miles per any one mile of railroad yard track, even at Chicago, do not approach the density that is shown by economically successful main line electrifications now operating. The complete report doubtless contains figures that betray not only this but other underlying conditions equally important. It would indeed be presumptuous, if not impossible, for an outsider to criticise the financial conclusion, without having had the opportunity to study the conditions very carefully and with trained insight. Electrical engineers may confess to a sense of disappointment, but they are no doubt open to conviction by the broad and careful reasoning of the engineers who have made the estimates. They will at least be saved the trouble of controversy over the system question, for it seems hardly worth while to waste words over the manner of creating an annual deficit of nearly \$15,000,000, particularly when the net costs of the three systems proposed differ by such small percentages. It may be fortunate in the long run, that the state of the art (which has progressed somewhat since 1912) was not such as to give electric power the decision.

There is a hint in the synopsis published Dec. 4 that some consideration has been given to the possibility of a few railroads electrifying separately. Presumably, such roads would be those having the heaviest suburban traffic, and if electrifications were carried out upon these roads with an eye to financial economy, it might well happen that only such tracks would be equipped as would permit a favorable economic result. The fact that electrification of Chicago's tracks as a whole means a financial deficit does not necessarily mean anything of the kind for such individual roads as have favorable conditions. It may turn out, when once the public is convinced that the railroad smoke is responsible only for a very small fraction of the total pollution, that the possible willingness of some one or more roads to electrify their suburban lines will be treated by the public as a matter of economics, and

not as a pretext for attempting to force all the others into it, regardless of financial consequences.

It seems surprising in the abstract, that, after all the mechanical, electrical and chemical developments of the past few years, no self-propelled substitute for the steam locomotive has become available that can be applied to heavy traction duty on a large scale. The internal-combustion engine has done wonders in recent years. It has in many instances won such an economic victory over electric traction in the lighter passenger service, that its invasion of the heavy traction field has evidently been anticipated as a possibility. Its mechanical limitations, however, have proved a bar to its progress in this direction, while electric power, though mechanically feasible, is financially impracticable in the present instance. It may be questioned whether carrying of liquid fuel on locomotives, in large quantities is a greater risk than that due to the presence of thousands of gasoline-carrying automobiles in congested city streets.

Within recent months it has become known that powdered coal fuel has been successfully used on steam locomotives, not only with great reduction of visible smoke, but also resulting in actual financial savings in operating cost. One of the roads entering Chicago is now experimenting with it, and reports encouraging results. This is another instance of what intensive engineering has done for the steam locomotive, in raising its operating economy, and in narrowing and sometimes obliterating or even reversing the margin by which electrification might render it obsolete. The enormous costs of wholesale electrification have prompted some of the larger railroad companies to pay for economical improvements in the steam locomotive which they would have scoffed at a dozen years ago. George Stephenson's iron horse has been bred up to a much higher degree of efficiency, with possibilities not yet exhausted.

Engineers familiar with the subject know very well that it takes a particularly special traffic situation to make electric power attractive financially. There are doubtless such situations in Chicago and elsewhere, but it is not likely that extensive switchyards conduce to electrical economy.

The committee lays down the proposition that, on the face of the facts, atmospheric pollution can be cured only with the aid of the entire fuel-burning community, and not by the railroads alone. It will probably require several more years of study to work out practical means for bettering domestic and manufacturing fuel combustion, and some more years thereafter to get them adopted.

Huge quantities of fuel have to be burned in Chicago. The question is one of handling the products of combustion with the least detriment to the general public. It is to be hoped that Chicago's citizens may be guided in the conclusions, not by public spokesmen of the type whose perspective is limited by self-interest, but by the constructive and judicious opinions of impartial engineers, whose value as trustworthy guardians of the public interest is now beginning to be recognized.

W. N. SMITH, M.E.

The Royal Commission of Norway has recently prepared a remarkably complete report dealing with the question of State waterfalls and their exploitation and with the whole question of Norway's supply of energy from hydroelectric power stations. The commission recommends that the large waterfalls which the State owns in northern Norway may be early dealt with, as they are well suited both for large industrial undertakings and for the electrification of a northern railway.

MID-YEAR MEETING  
CHICAGO  
FEBRUARY 4, 1916

# American Association News

MID-YEAR MEETING  
CHICAGO  
FEBRUARY 4, 1916

Reports of Meetings of the Executive, Public Relations, A. E. R. A. Advisory Committees, Also Committee on President's Recommendations—Activity Among the Company Sections—Detailed  
Appendix of Committee Subject Assignments for 1916

## EXECUTIVE COMMITTEE OF THE AMERICAN ASSOCIATION

A meeting of the executive committee of the American Electric Railway Association was held at New York on Dec. 16. Those in attendance were: Charles L. Henry, president; L. S. Storrs, first vice-president; T. S. Williams, second vice-president; John J. Stanley, third vice-president; T. P. Kilfoyle, president Accountants' Association; John Lindall, president Engineering Association; H. A. Nicholl, president Transportation & Traffic Association; George Carson, president Claims Association, and past presidents C. S. Sergeant, H. H. Vreeland, James F. Shaw, Arthur W. Brady and C. Loomis Allen.

The report of the meeting of the committee on recommendations on the president's address was received and adopted. The committee also received a report from B. I. Budd, chairman committee in charge of arrangements of the mid-year meeting, recommending Friday, Feb. 4, as the date of meeting of the mid-year convention. This was adopted. All of the meetings will be held at the Congress Hotel, and the dinner in the evening will be held at the same hotel. It was decided to devote the technical meetings during the day to considering the subjects of "rate of return" and "valuations." There will be a paper on each of these subjects, and each paper will be followed by short addresses from four speakers to be selected in advance. For the dinner in the evening it was decided to have only four addresses. One will be made by the president of each association, and the other two addresses will be made by speakers of national reputation. Their names will be announced as soon as the speakers are selected. The price per plate will be \$10. The committee on arrangements consists of B. I. Budd, chairman; Leonard A. Busby and Henry A. Blair, representing the American Association, and Charles C. Peirce, L. E. Gould, E. F. Wickwire and M. B. Lambert, representing the Manufacturers' Association.

The executive committee also considered but did not approve the changes in organization of the affiliated associations suggested by the standards committee of the Transportation & Traffic Association at the San Francisco convention. The suggestion was that the American association should appoint a committee from its own members or a joint committee from the four affiliated associations to consider various changes in the constitution and by-laws of the several associations by which the following changes, among others, would be brought about. (a) that the president should have charge of the finances, (b) that there should be but one vice-president for each of the affiliated associations, (c) that there should be an executive committee of nine consisting of the three officers and six elected members, with past presidents as honorary members. Under this plan the vice-president would be instructed to keep especially in touch with committee work and would submit to the president on June 1 a recommended list of appointments for the new committee on subjects, to be appointed not later than Aug. 1, and would submit to the executive committee at its last meeting at the convention a tentative list of recommended committee appointments for the ensuing year.

## COMMITTEE ON PUBLIC RELATIONS

A meeting of the American Association committee on public relations was held at the Metropolitan Club in New York on Wednesday, Dec. 15, 1915. Those in attendance were C. Loomis Allen, chairman, H. C. Bradley, A. W. Brady, E. B. Burritt, J. K. Choate, H. C. Clark, S. M. Curwen, H. C. Donecker, C. L. Henry, J. R. Lovejoy, J. H. McGraw, J. D. Mortimer, C. C. Peirce, L. S. Storrs, Guy M. Tripp, H. H. Vreeland, T. S. Wheelwright and T. S. Williams.

The sub-committee arrangement made last January was changed by combining the sub-committees on the dissemination of literature and lectures on Chautauqua circuits and elsewhere, under the chairmanship of Mr. Tripp. Messrs. Lovejoy, Vreeland and McGraw were appointed a sub-committee on co-operation with similar committees of other public service associations, with the last-named as chairman. Messrs. Brady, Wheelwright and Williams were appointed as the sub-committee on the preparation of popular articles for publication in magazines and periodicals, with Colonel Williams as chairman. The sub-committee on newspaper advertising was discontinued. Reports on the work which was done by last year's committees were received.

## "AERA" ADVISORY COMMITTEE

A meeting of the American Association "Aera" advisory committee was held in New York, Dec. 15, for general discussion regarding contributions to the association magazine. Those present were H. C. Donecker, Newark, N. J., chairman; George Carson, Seattle, Wash.; H. C. Clark, New York, N. Y.; T. P. Kilfoyle, Cleveland, Ohio; John Lindall, Boston, Mass.; H. A. Nicholl, Anderson, Ind., and C. C. Peirce, Boston, Mass.

## COMMITTEE ON PRESIDENT'S RECOMMENDATIONS

A meeting of the committee of the American Association to consider the recommendations made by Mr. Allen at the San Francisco convention was held at the office of the association on Wednesday, Dec. 15. Those present were Arthur W. Brady, Anderson, Ind., chairman; General George H. Harries, Louisville, Ky.; Thomas N. McCarter, Newark, N. J.; J. R. Lovejoy, representing E. W. Rice, president of the General Electric Company, and Guy W. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company. In addition, the following representatives of the executive committee of the American Electric Railway Manufacturers' Association were in attendance: E. H. Baker, W. L. Conwell, C. R. Ellicott, C. S. Hawley, B. A. Hegeman, Jr., W. H. Heulings and C. C. Peirce.

The principal subject considered by the committee was the recommendation made in San Francisco by President Allen in regard to a change in the relations between the Manufacturers' Association and the American Association. The sentiment was expressed that a closer relationship should exist, and it was finally agreed to recommend that manufacturing com-

panies should be admitted as company members of the American Electric Railway Association, with all of the privileges now possessed by railway companies as company members, including the right to vote and of their delegates to hold office. This recommendation was later approved by the executive committee of the American Electric Railway Association.

### PUBLIC SERVICE SECTION

The annual smoker of the section was held in Newark, N. J., on Dec. 16, 1915, with a large attendance. Good entertainment, plenty of smoking materials and a substantial supper served in the company dining room were the features.

### CONNECTICUT COMPANY SECTION

As was announced in last week's issue company section No. 7 was formed amid great enthusiasm on Dec. 7, 1915. It is expected that the enrollment will reach 175 by the date of the January meeting. The membership includes general officers, office employees, local managers, superintendents, store keepers, master mechanics, general foremen, line foremen, chief engineers of power stations and others.

The election resulted as follows: President, W. J. Flickinger; vice-president, I. A. May; secretary, W. E.

Jones; treasurer, G. H. Crosson; director for one year, P. W. Ripple; director for two years, C. H. Jones; director for three years, C. R. Harte, and company representative, W. P. Bristol.

### MANILA COMPANY SECTION

At the October meeting, held on the fifth, a safety-first program was carried out. C. H. Van Hoven read the introductory lecture on accident prevention furnished by the N.E.L.A. lecture bureau, and this was repeated in Tagalog. Safety-first slides were shown and described by W. A. Smith. An open discussion followed.

The meeting was held in the "Meralco" palm garden and it was attended by a large number of guests and employees, many of the Filipino employees being accompanied by their families.

### COMMITTEE SUBJECT ASSIGNMENTS FOR 1915-1916

The subject committees of the various affiliated associations have now completed the work of assignments to the different committees appointed for 1915-1916. These subjects have been approved by the executive committees of the various associations interested, and a list of them is published below:

## Committee Subject Assignments for 1915-1916

### ENGINEERING ASSOCIATION

#### BUILDINGS AND STRUCTURES

- 1.—Review of association's existing standards and recommendations.
- 2.—Design of shelters (considering 1912 report), bridges, culverts, fences, etc., looking to their adoption.
- 3.—General specification and form of contract for railway structures.
- 4.—Proper provision for expansion and contraction in restrained concrete structures, consideration to be given to both plain and reinforced concrete, with provision made to properly waterproof and protect such arrangement.
- 5.—Oil houses and their equipment.
- 6.—Consideration of tentative safety code of the United States Bureau of Standards in so far as it applies to the work of this committee.

#### ELECTROLYSIS

Co-operate with the association's representatives on the national joint committee on electrolysis, continuing a study of the general subject.

#### EQUIPMENT

- 1.—Review of association's existing standards and recommendations, with special reference to the following:
  - (a) Revision of steel wheel design covering both 2½-in., 3-in. and 3½-in. tread, and wheel from 21 in. to 37 in. in diameter.
  - (b) Revision of contour of tread and flange of wheel.
  - (c) Revision of standard design of brakeshoes, brakeshoe head and keys.
  - (d) Revision of standard design of axles, with a view toward including smaller sizes to take care of recent development in motor design for low-floor cars.
- 2.—Standardization rules of the A. I. E. E. (July 1, 1915, edition) in so far as they apply to the work of this committee.
- 3.—Car ventilation.
- 4.—Lighting of electric street cars.
- 5.—Standard sizes of carbon brushes for street railway motors.
- 6.—M. C. B. brass for heavy electric traction.
- 7.—Design of limit of wear gage for association's standard flange contours.
- 8.—Design of trolley catcher socket which will permit of using any make of catcher without necessitating change of socket.
- 9.—Painting cars, including consideration of the various so-called "quick drying" methods that have been suggested within the past few years, also the enameling of cars, with the idea of providing specifications for the application of same.
- 10.—Consideration of tentative code of safety rules of the United States Bureau of Standards in so far as they apply to the work of this committee.
- 11.—Investigation of rail corrugation in its relation to the use of rolled or forged steel wheels versus the use of chilled cast-iron wheels.

#### HEAVY ELECTRIC TRACTION

- 1.—Review of association's existing standards and recommendations, with special reference to:
  - (a) Change in designing line for equipment in standard clearance diagram for third-rail working conductors. (Co-operating with American Railway Engineering Association and American Railway Association.)
  - (b) Consideration of standardization rules of A. I. E. E. (July 1, 1915 edition) in so far as they apply to the work of this committee.
- 2.—Study of modern electric locomotives, including safety devices. (To cover electric locomotives that are used in interurban service.)
- 3.—Co-operation with committee on block signals and power distribution in preparing clearance diagram for block signals.

- 5.—Consideration of tentative safety code of United States Bureau of Standards in so far as it applies to the work of this committee.

#### POWER DISTRIBUTION

- 1.—Review of existing standards and recommendations.
  - (a) Revisions of specifications for overhead crossings of electric light and power lines, if completed by the national joint committee on overhead and underground line construction.
  - (b) Revision of standard stranding table.
  - (c) Revision of standard specification for rubber insulated wire and cable for power distribution purposes as suggested by W. A. Delmar of Association of Railway Electrical Engineers.
- 2.—Consideration of standardization rules of A. I. E. E. (July 1, 1915 edition) in so far as they apply to the work of this committee.
- 3.—Clearance diagram for semaphore signals. (To be considered jointly with committee on heavy electric traction and committee on block signals.)
- 4.—Further consideration of the subject of concrete poles, including deflection formulas and tables for tapered sections.
- 5.—Further specifications for overhead line material, including especially a standard thread for pins and insulators (this subject to be taken up in connection with other associations), and specification for structural steel cross-arms and fittings.
- 6.—Consideration of various types of third rail construction with description, and with a view to preparation of specifications.
- 7.—Collection of data preparatory to possible standard specifications for high-voltage d.c. and catenary trolley construction.
- 8.—Consideration of tentative safety code of United States Bureau of Standards as it affects line construction.

#### POWER GENERATION

- 1.—Review of association's existing standards and recommendations.
- 2.—Consideration of standardization rules of the A. I. E. E. (July 1, 1915 edition) in so far as they apply to the work of this committee.
- 3.—Advantages and disadvantages of 60-cycle apparatus, with particular reference to rotary converters for railway service.
- 4.—Collect and, if practicable, publish data and information that may be available in regard to operating performances of railway power systems.
- 5.—Report on good practice in regard to smoke abatement from the standpoint of smoke observations and appliances and devices used for determining smoke density.
- 6.—Consideration of the boiler code of the A. S. M. E. looking to its adoption by this association.
- 7.—Specifications for the purchase of fuel.
- 8.—Consideration of tentative safety code of the United States Bureau of Standards in so far as it affects the work of this committee.

#### STANDARDS

- 1.—To approve new sections for insertion in Engineering Manual.
- 2.—To consider further the standard form for drafting specifications.

#### WAY MATTERS

- 1.—Review of association's existing standards and recommendations.
  - (a) Specifications for special work. (These specifications to be revised and corrected grammatically and be re-drafted to conform to the proposed standard of the committee on standards.)
  - (b) Revision of recommended design of 7-in. and 9-in. joint plates with special reference to sizes of bolt holes and fits. (Recommended that title of this subject be changed to read "Designs for Drilling of Rails and Joint Plates and Their Application.")

(c) Recommended symbols for recording surveys. (Committee of 1915 on way matters recommends title be changed to "Conventional Signs for Recording Surveys." To confer with such other committees as in the opinion of the committee would be affected by the symbols suggested.)

- (d) Recommended designs for layouts for switches, mates and frogs.
- 2.—Ballast for suburban and interurban lines.
  - 3.—The use of rolled manganese and other alloyed steel rails.
  - 4.—Investigation of the use of high elastic steel machine bolts  $1\frac{1}{4}$  in. diameter, ream or driving fit in connection with mechanical joints of standard design in curves.
  - 5.—Pavement for use in connection with girder grooved and plain girder rails to cover:

(a) The formulation of a specification covering the manufacture and installation of the various types of paving which might be used in connection with the car tracks.

- (b) The matter of proper foundation should also be incorporated in such specification as well as the type of filler and cushions.
- 6.—Consider for approval specification for preservatives and treatment of woods for inclusion in the engineering manual.
  - 7.—Preparation of specifications with definitions for sundry track materials such as ties, track spikes, bolts, tie rods, tie plates, etc., such investigation to be through co-operation with the A. S. T. M. in accordance with the procedure prescribed in the instructions to the committee.
  - 8.—Report upon the most efficient types of hand track tools.

## TRANSPORTATION & TRAFFIC ASSOCIATION

### CONSTRUCTION OF SCHEDULES AND TIMETABLES

- 1.—Co-ordinate work of past committees.
- 2.—The skip-stop development and what it means, particularly from the community standpoint. Study influence of frequency of stops on schedule speed and the influence of schedule speed on operating costs.
- 3.—Revise the standard interurban timetable as adopted in 1911.
- 4.—Study of traffic regulations.
- 5.—Exhaustive study of running time as affecting scheduled methods of determining same, together with variable effect of traffic on same, as well as effect on other elements, such as power, etc.

### EXPRESS AND FREIGHT TRAFFIC

- 1.—Co-ordinate past work of previous committees.
- 2.—To make further effort to ascertain which style of contract is the most favorable from a revenue standpoint with old line express companies, "a tonnage basis," "a mileage basis," or "a pro-rate of the rates."
- 3.—To make an effort to secure a form of contract which the committee may recommend for the use of traction lines in contracting with old line express companies.
- 4.—Further information tending to show the growth of interchange business with steam railroads.
- 5.—Study motor truck operating costs, etc.

### FARES AND TRANSFERS

- 1.—Co-ordinate work of previous committees.
- 2.—Recommendation for a method of interchange of passengers by means of paper transfers, or otherwise, with the idea of preventing abuse:
  - First, on the part of passengers.
  - Second, exchange of transfers by conductors.
 Recommendation for an efficient method of checking transfers with a view to discovering irregularities in either of the above ways.
- 3.—Collection of fares in congested areas and terminals, including fare collectors, etc.

### PASSENGER TRAFFIC

- 1.—Co-ordinate work of previous committees.
- 2.—Interline passenger traffic arrangements between interurban and steam roads, with particular reference to collecting data from member companies who have such traffic agreements with steam lines.
- 3.—Ascertain basis of participation of interurban lines in through rate, where the interurban line is the original carrier, and where tickets read to points beyond the next connecting line.
- 4.—Financial aspects of the operation of open cars.
- 5.—Special car methods and results.

### RULES

- 1.—Co-operate on block signal rules.
- 2.—Rules for two or more car unit operation.

### TRAINING OF TRANSPORTATION EMPLOYEES

- 1.—Co-ordinate work of previous committees.
- 2.—Eyesight and hearing standards. Watch inspection methods. (These to be given additional study with recommendation as to definite standards.)

## JOINT COMMITTEES

### BLOCK SIGNALS

#### *Engineering Association Subjects*

- 1.—Review of association's existing standards and recommendations.
- 2.—Consideration of standardization rules of A. I. E. E. (July 1, 1915 edition) in so far as they apply to the work of this committee.
- 3.—Digest of block signal laws and rulings. (This to cover the period from June 1, 1914, to June 1, 1916.)
- 4.—Bibliography of block signal installation from June 1, 1915, to June 1, 1916, following the same plan as started by the 1915 committee.
- 5.—Designs of additional block signal apparatus looking to its adoption.
- 6.—Clearance diagram for semaphore signals. (As the committee did not consider this subject jointly with the committees on heavy electric traction and power distribution, the 1915 committee

on standards referred it back for further consideration so there would be no conflict with existing recommendations.)

- 7.—Block signal rules. Continuation of the subject as considered by the 1915 committee.
- 8.—Study of block signal operation, covering maintenance cost, efficiency of operation and effect on traffic. This subject includes definition of signal failure.
- 9.—Highway crossing protection, including aspect for highway crossing signals that can be adopted by the association.
- 10.—Light signals for interurban railways. (Should be given further consideration with a view to the adoption of definite sizes of lenses.)
- 11.—Consider tests for contactor type of recording signals.
- 12.—Consideration of tentative code of safety rules as prepared by the United States Bureau of Standards in so far as it applies to the work of this committee.

#### *Transportation & Traffic Association Subjects*

- 13.—Co-ordinate past work of the committees on block signals.
- 14.—Bring up to date recommendations for the committee on standards.
- 15.—Study methods of highway crossing protection.
- 16.—Study methods of drawbridge protection.
- 17.—Develop form of contract for signal installation.
- 18.—Study of operating without dispatchers.

## CLAIMS TRANSPORTATION

#### *Transportation & Traffic Association Subjects*

- 1.—Co-ordinate past work of the committees on claims transportation.
- 2.—Investigate the applicability of moving pictures to safety first work in its three phases, namely, training of employees, education of school children, and education of the general public.
- 3.—Co-ordinate safety first movement.
- 4.—Safety advertising on cars.

#### *Claims Association Subjects*

Not yet assigned.

## ENGINEERING ACCOUNTING

#### *Engineering Association Subjects*

- 1.—Inter-departmental charges.
- 2.—Consideration of the sub-division of accounts covering steam power station costs as submitted by the 1915 committee on power generation.
- 3.—Development of a property ledger looking toward the maintenance of a continuous inventory. (This to be considered as applying to the entire physical property.)

#### *Accountants' Association Subjects*

Not yet assigned.

## LIFE OF RAILWAY PHYSICAL PROPERTY

#### *Engineering Association Subjects*

Should co-operate with committee on valuation and continue the work of compiling an up-to-date bibliography on valuation.

#### *Accountants' Association Subjects*

Not yet assigned.

## TRANSPORTATION ACCOUNTING

#### *Transportation & Traffic Association Subjects*

- 1.—(a) Investigation of cost of handling baggage free to determine whether it brings business to the line, and if so, whether the cost of handling this baggage wipes out the profit resulting from the fare received.
  - (b) Investigation and subdivision of power cost between construction, maintenance and operation.
- 2.—Graphic presentation of transportation data and statistics.

#### *Accountants' Association Subjects*

Not yet assigned.

## TRANSPORTATION ENGINEERING

#### *Engineering Association Subjects*

- 1.—Train operation in city service. (It is understood there have been recent developments which would warrant further consideration at this time.)
- 2.—Economics of one-man car operation. (To carry on work started by committee on passenger traffic of T. & T. Association.)
- 3.—Two or more car operation, interurban service:
  - (a) Passenger service.
  - (b) Freight service.
 (Investigation to cover cost of operation and comparative figures for single car operation.)
- 4.—Effect of car and equipment design on duration of stops for both passenger and freight service. (Car design to be studied from a traffic standpoint in all its phases, first standardizing the method of determining results, i. e., having identical formulae and practice for obtaining observation and data from which conclusions are drawn. Investigation to include specimen data sheet showing information which should be obtained in order that member companies who desire to follow the recommendations may have full information before them.)
- 5.—Investigation of braking distance on interurban cars with special reference to location of block signals.
- 6.—Study of electric current saving devices, including summary showing results obtained, together with costs including maintenance, etc.

#### *Transportation & Traffic Association Subjects*

- 7.—Train operation in city service—trailer versus motor cars.
- 8.—One man car operation—comprehensive study—regulations in different localities—increase in, etc.
- 9.—Consider rules and regulations for interchange of equipment between interurban lines and between interurban and steam lines. Submit report for further consideration from accounting, operating and mechanical standpoints.

# Equipment and Its Maintenance

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

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

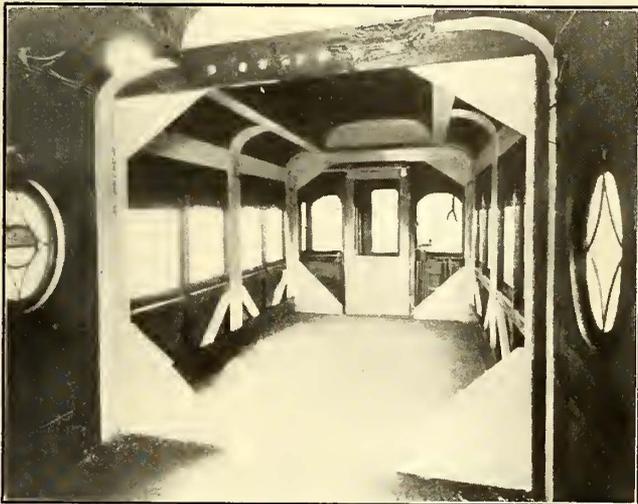
## Reinforcing High-Speed Interurban Cars

BY W. J. BOWMAN, MASTER MECHANIC AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

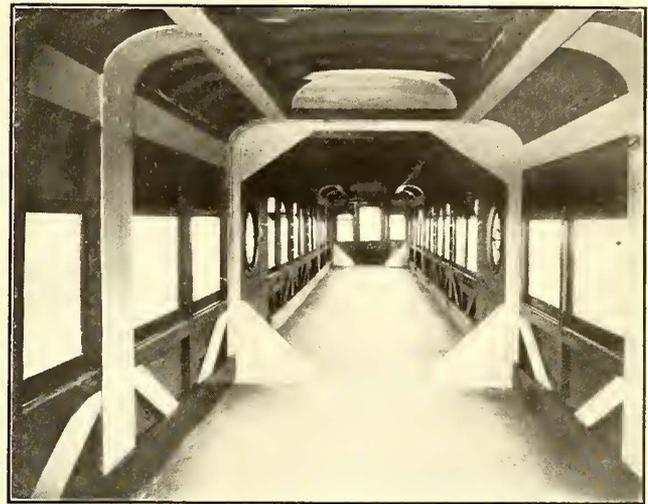
Excessive racking throughout the bodies of some of the cars on the high-speed Aurora, Elgin & Chicago Railroad, Aurora, Ill., has been overcome with 712 lb. of steel reinforcement at a cost of approximately \$390 per car. An unfortunate combination of 60-ft. rails with staggered joints and approximately 30-ft. truck centers made car-body torsional strains especially severe on this road. These conditions, together with the high rates of acceleration and maximum speeds of more than 66 miles per hour required an unusually strong body structure to withstand the strains without movement ultimately developing in the framing. An exceptionally interesting series of experiments in car reinforcement was necessary

do this properly all inside finish had to be removed and at first wooden diagonals were placed at all possible points in the body. Tie rods also were provided at the intermediate partition and the end bulkheads, and the underframe was braced by laying diagonal flooring. A test of the car reinforced in this manner showed that while racking had been materially relieved the wooden bracing was insecure and, therefore, not permanent.

A continuous steel inside sheathing, bolted to the side sills and the window posts and extending up to the window stools, was then tried. This with tie rods at the two end posts and at the intermediate partition, was found insufficient. While it greatly reduced movement in the body it was not reinforcement enough to make the roof and the side plates as rigid as they should be. To stiffen this point  $\frac{3}{8}$ -in. x 10-in. plates were provided on the window posts, which extended to the side plates,



REINFORCED INTERURBAN CARS—FIRST TYPE OF REINFORCING IN FRONT END OF CAR



REINFORCED INTERURBAN CARS—FIRST TYPE OF REINFORCING IN REAR END OF CAR

before the final form was adopted. These tests passed from the simple substitution of wooden knee braces to steel reinforcement weighing 2600 lb. and costing approximately \$765 to install. By a process of elimination and simplification, however, both the weight and the cost were brought down to the amounts before mentioned.

In the beginning one of the cars needing reinforcement was stripped of the seats and operated over various sections of the road to determine the points in the car structure where movement occurred. Some movement was observed in the underframe, which was of composite wood and steel construction, but the excessive racking and wearing was found to be in the body superstructure. Both at starting and stopping there was a tendency for the body above the side sills to move forward or backward, with the bottoms of the window posts as the pivotal points. After this test a decision was reached that the only way to correct the trouble was by cut-and-try methods, too many factors entering to make it a strictly engineering problem. Diagonal bracing in all three planes was found to be necessary to counteract completely all movement in the car body. To

thence along the roof of the deck sill. Similar plates were through bolted to the side plates and extended from the end bulkheads to points inside the body bolsters. A third longitudinal plate of the same section was bolted to the underside of the deck sill and also extended from the end bulkheads to points inside the body bolsters. All of these longitudinal plates were riveted to the vertical plates at the corner and window posts.

Transverse diaphragms consisting of angles, continuous from side sill to side sill and conforming to the car-body section, were introduced at the two end bulkheads and at the intermediate partition. Heavy gusset plates were riveted to these angles, and they were further reinforced to resist torsional strains by being riveted to the  $\frac{3}{8}$ -in. x 10-in. window post plates. A view of this type of reinforcement is shown in an accompanying illustration. It will also be noted that the wooden diagonal brace extending from the double window posts at the window stools to the single window posts at the side sills were retained as side stiffeners.

All of this reinforcing steel weighed approximately 2600 lb., and the cost of material and labor to reinforce a car was approximately \$765. While this type of re-



REINFORCED INTERURBAN CARS—FRONT END OF CAR WITH GUSSET REINFORCING IN PLACE



REINFORCED INTERURBAN CARS—REAR END OF CAR WITH GUSSET REINFORCING IN PLACE

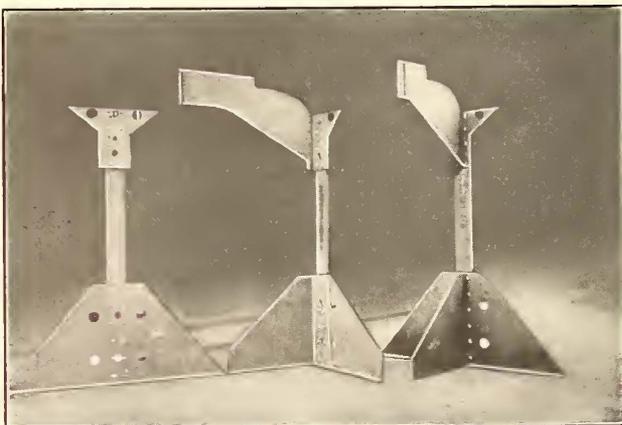
inforcement solved the problem, it was considered unsatisfactory because of its high cost and excessive weight. Tests were then made to determine how the weight and the cost of installation could be reduced without diminishing the effectiveness of the reinforcement. The first step was to reduce the  $\frac{3}{8}$ -in. metal to  $\frac{1}{8}$  in. and to substitute unit structures for the heavy plates at the alternate double window posts, at the intermediate partition and at the end bulkheads. The three types of these unit reinforcements are shown in one of the accompanying illustrations. With these the weight was reduced to 1420 lb. and the cost of installation was approximately \$500.

Essentially these unit reinforcements were made up of 6-in. 11 $\frac{1}{4}$ -lb. channels with flanged gussets at the side sills and at the side plates. At the double window posts the gussets extended 2 ft. 8 $\frac{1}{2}$  in. each side of the post, and the channels filled the space between the two posts. At the corner posts the gussets were set at right angles to each other and extended 3 ft. 1 $\frac{1}{2}$  in. along the car sides and 2 ft. 7 in. into the bulkheads at the floor line and completely across the car at the roof line. At the intermediate partition longitudinal and transverse gussets were required. The transverse gusset at the floor line extended 2 ft. 7 $\frac{1}{2}$  in. toward the center of the car body, and that at the roof, 2 ft. 10 $\frac{1}{2}$  in. All of these reinforcements were through bolted to the side sills and plates and to the window posts and cross-bearers. Two types of cars are being reinforced,

and for the one 53 ft. long, 8 ft. 8 $\frac{1}{2}$  in. wide with 34 ft. 3 in. truck centers the unit reinforcement was considered to be the simplest form because of the window-post construction.

The third stage in simplifying the reinforcement and reducing the weight included the elimination of the 6-in. channel members along the double window posts, and changing somewhat the dimensions of the gusset plates. As a substitute for this the double window posts which were made up of two members were provided with oak filler blocks continuous from the side sills to the side plates. These were through bolted to make them serve as a single member. The gusset plates were through bolted to the side sills and plates and to the cross-bearers. All gussets were also securely fastened to the faces of the window posts with wood screws. Movement in the roof between the side plates and the deck sills was eliminated by adding  $\frac{1}{2}$ -in. x 1 $\frac{1}{2}$ -in. metal carlines to the wooden carlines over the double window posts. Bolted to each side of these were two angle braces of the same section, which were also through bolted at the side plates and the deck sills. Tie rods  $\frac{5}{8}$  in. in section also extend between the side plates at the intermediate partition, and just over the door openings in the bulkhead two  $\frac{1}{4}$ -in. x 2-in. tie rods were installed. The gusset plates at the end bulkheads were through bolted to the corner posts, side and end sills.

Reinforcing in the underframe in both types of cars consisted of diagonal braces between the cross-bearers in the floor system. The underframes of the original cars consisted of 9-in. I-beam side sills and two 6-in. I-beam center sills, and the transverse floor system was made up of all wooden members. A view of this type of reinforcement at the front and rear ends of a car 47 ft. 4 in. long, 8 ft. 8 in. wide and with 28-ft. 11-in. truck centers is shown in two of the accompanying illustrations. It will also be observed that the space between the two center sills was completely closed with 2-in. material to produce the same result as the diagonal bracing in the remainder of the floor system. The blocking between the center sills was secured by tie rods and spiked, and the diagonal floor braces were wedged down by separate blocks and spiked, to make them secure. This construction made the floor system very rigid and eliminated the weaving. In all twenty-five cars will be reinforced either with the gussets or with the unit system, depending upon the character of framing.



REINFORCED INTERURBAN CARS—UNIT TYPE OF REINFORCEMENT

## Change from Half to Full Flanged Brakeshoes

BY R. E. HEWITT, MASTER MECHANIC SOUTHERN PACIFIC COMPANY ELECTRIC LINES, WEST ALAMEDA, CAL.

The standard brakeshoe for motor cars used on the Oakland, Alameda and Berkeley electric lines of the Southern Pacific Company was a partially flanged shoe known as Y-1 manufactured by the American Brake Shoe & Foundry Company.

The trouble with this shoe was that if one of the flanges at the top or the bottom of the shoe broke off the shoe was apt to override the sides of the tire, which naturally shortened the shoe life and slightly reduced the braking power. This condition also had a detrimental effect on the tires, as the shoe at the point where the flange broke off had a tendency to wear into the throat of the wheel flange and caused the flange to wear sharp quite rapidly.

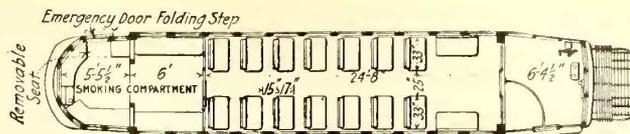
Last May a test was made of the K-280 diamond, steel-back, full-flanged brakeshoes manufactured by the same company, and the results obtained with this type of shoe were so satisfactory that it was deemed advisable to adopt them as standard for our motor cars.

At that time eight shoes of Y-1 type made a total of 16,592 miles, with an average mileage per shoe of 2074. Eight shoes of the K-280 type gave a total mileage of 34,195, with an average mileage per shoe of 4274.

The advantage of the full-flanged shoe is that it adheres to the contour of the tires at all times, causing the tires to wear more evenly and lessening the percentage of sharp flanges.

## One-Man, Two-Man Cars for Spokane

Confronted by the problem of competing with the privately-owned automobile and the public jitney, the Washington Water Power Company, Spokane, Wash., has remodeled its large four-motor Brill cars which are in service in the "Falls City" for operation as near-side, pay-as-you-enter, one or two-man cars. Operating tests covering thirty days have shown the cars to be a great success from the public and the company's stand-



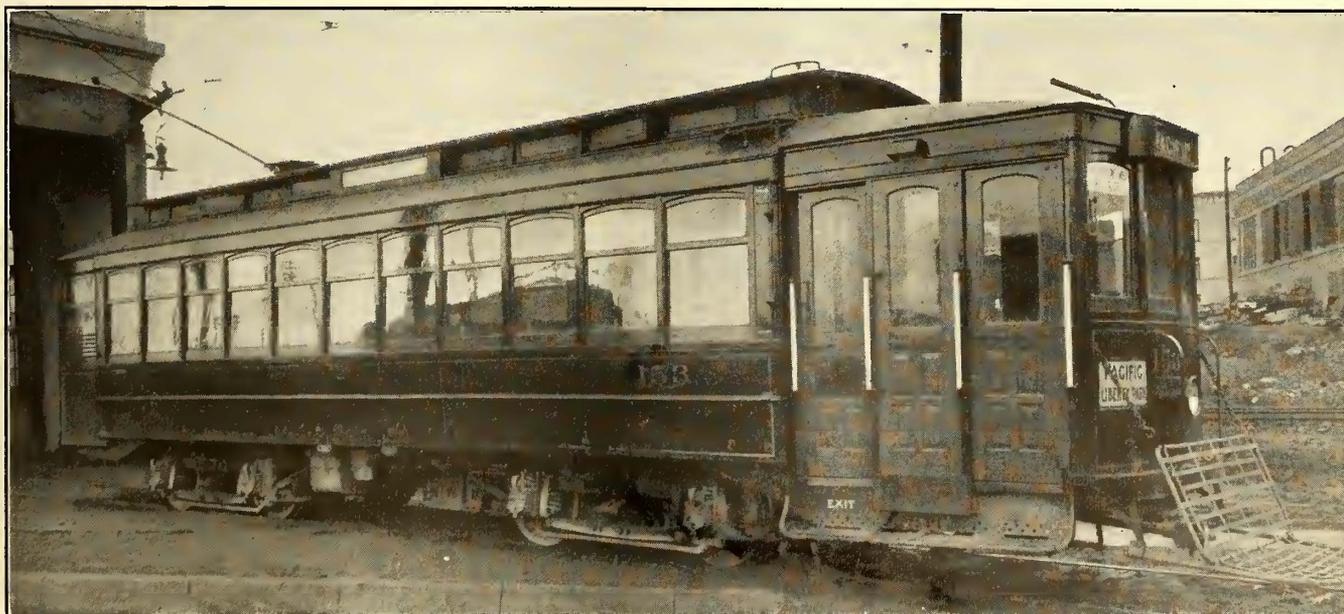
SPOKANE CAR—GENERAL PLAN OF CAR

points. The cost of the remodeling has been about \$300 a car, and a considerable decrease in operating cost has accompanied their use.

One of the problems in making over pay-as-you-enter cars into near-side cars is taking care of the long overhang at the rear end. This was overcome in the present case by reversing the car and changing the entrance and exit doors from one side to the other, leaving the longer overhang on the front. The motorman can thus watch for pedestrians and vehicles who might be in danger on account of the sweep of the car. The change leaves very little overhang on the rear.

In remodeling, the steps were lowered in all about 3 1/2 in., making the distance from the ground to the first step, 14 in.; the next step 13 in., and the step from the platform to the car 11 1/2 in. Two sliding doors are provided, the one where passengers enter being next the motorman. The other door serves as an exit. There is a small reflector light between the two front doors on the outside, which illuminates the steps. The sliding doors operate separately or in combination so that people getting off do not interfere with those getting on, each door sliding into a pocket between the entrance and the exit.

The rear portion of the car is divided off by means of a partition with a sliding door placed immediately in front of the rear longitudinal seat. This portion of the car is reserved for smokers. Many patrons who work in offices and stores where smoking is not allowed are taking advantage of this smoking compartment. The controller was allowed to remain at the rear end of the car for switching purposes. At the rear end of the car an emergency door with folding step was provided. This door is for use in case of accident only, and is held in place by a spring pin. A safety device was arranged so that if the pin is removed and the door opened a



SPOKANE CAR—CAR REMODELED FROM REAR-ENTRANCE PAY-AS-YOU-ENTER TYPE FOR NEAR-SIDE, ONE OR TWO-MAN OPERATION



SPOKANE CAR—REMODELED VESTIBULE, INTERIOR LOOKING TOWARD THE REAR, INTERIOR LOOKING FORWARD

quarter of an inch, an alarm gong rings near the motorman warning him to stop the car immediately.

There are two hangers for the trolley catcher at the back of the car; one located above the rear windows and the other in the regular position. The top one is used in case mischievous boys attempt to pull down the trolley. The cars are equipped with Esterline Golden Glow headlights, and Mazda lamps are used throughout. The lighting in the front vestibule is automatic. When the door opens to admit a passenger, one lamp in the car is switched off and another lights near the motorman to give him illumination for making change. The entrance and exit is equipped with white enamel grabhandles, which are conspicuous by night as well as by day.

In the distribution of labor with these cars shifts are arranged so as to provide two men on each car when traffic is heavy. In the preliminary tests of the system it was found that two and one-third men can do the work of four on lines with average travel, without loss of efficiency. Motormen and conductors break in for both ends of the car. The shifts are arranged so that there is an overlap between 7 and 9 a. m.; 11.30 a. m. and 1.30 p. m. and 4.30 and 7.40 p. m., making two runs of about nine hours each and a swing shift of about seven and one-half hours.

A scheme has been adopted by the company to curb the activities of "hold-up" men who might consider the late one-man cars, at the lonely ends of the line, as easy prey. A steel safe was placed in the basement of the company's bank, which fortunately is located at the traffic center of the system, to which a steel tube was run from the starter's booth. After 6 o'clock in the evening, when the conductors have accumulated an excess of money they deposit this in individual sacks bearing their names, when they come in from the ends of their lines. These sacks are returned to them at the receiver's office when they turn in at the end of their runs. The hold up men who "stick up" conductors in the outskirts hereafter will be able to secure only a few loose nickels and a bundle of cancelled tickets and transfers.

The remodeling of the cars as described above and the adopting of operating conditions to utilize them effectively have been carried out under the direction of R. A. Willson, general superintendent of railways Washington Water Power Company, who has furnished the above interesting particulars.

### Telephone Dispatching Eliminated by Signals at Portland, Me.

By the installation of eight blocks of Chapman automatic signals on the Westbrook division of the Cumberland County Power & Light Company's Portland (Me.) lines, telephone dispatching has been eliminated and a saving of five to eight minutes has been made in the running time when a car has been delayed between Portland, Westbrook, South Windham and Gorham. The signals are of the standard illuminated semaphore type made by the Electric Railway Signal Company, Charles N. Wood Company, agents, Boston, Mass.

The Westbrook division consists in the main of a system of interurban tracks over which cars are operated on different routes at headways ranging from sixty minutes to fifteen minutes. About  $2\frac{3}{4}$  miles out of Portland, at a junction designated as Rosemont, two main lines from the city are joined, the remainder of the route to Westbrook and beyond being by single track with the exception of an unsignaled double-track section in Westbrook 1.5 miles in length and 500 ft. of double track opposite the Westbrook carhouse.

The distance between turnouts on the division varies from 1000 ft. to 4000 ft. There are three railroad crossings on the single-track lines and two crossings of the



TYPICAL SIGNAL NEAR PORTLAND, ME.

local electric railway belt line. Certain cars are routed in or out of Portland via Woodford's and others via Brighton. In general a headway of fifteen minutes is maintained on the main line and the Brighton and Woodford branches into the city and the same interval is maintained out of town as far as the Westbrook car-house. Under normal conditions one car an hour is run to South Windham and one to Gorham, from Portland, with a similar service inward. The distance from Westbrook carhouse to Portland is about 6.5 miles via either Woodford's or Brighton. A telephone is installed at every turnout, but is seldom needed. In general, the setting and restoring contacts are located in the trolley wire about 90 ft. inside the switch point, on both the siding and the main line. The signals include the usual counting-in feature, and while the installation is standard in general arrangement, it illustrates the convenience of automatic equipment of this kind in facilitating the movement of traffic over single-track routes with and without branches.

### Operating Cost of Forced Draft Heaters Less than 2 Mills Per Car-Mile

Through the courtesy of the Empire United Railways the following data on the cost of operating Peter Smith hot-air heaters have been made available for the winter ending Feb. 23, 1915:

|                                                           |       |           |
|-----------------------------------------------------------|-------|-----------|
| Fuel:                                                     |       |           |
| Coal—68,642 lb.                                           | ..... | \$214.22  |
| Unloading coal, 68,642 lb. at 10 cents per ton.           | ..... | 3.43      |
|                                                           |       | \$217.67  |
| Maintenance:                                              |       |           |
| Two armatures, at \$24.                                   | ..... | \$48.00   |
| Twelve motor brushes at \$0.25.                           | ..... | 3.00      |
| Eight grates at \$1.50.                                   | ..... | 12.00     |
| Six brush-holder springs at \$0.05.                       | ..... | .30       |
| One commutator-end ball bearing.                          | ..... | 3.50      |
| Total material.                                           | ..... | \$66.80   |
| Labor on repairs, estimated.                              | ..... | 10.00     |
|                                                           |       | 76.80     |
| Total cost                                                | ..... | \$294.47  |
| Mileage made by cars from date of installation of heaters |       |           |
| Cost per car-mile.                                        | ..... | \$0.00172 |
| Cost per car a day, averaging 300 miles.                  | ..... | \$0.517   |

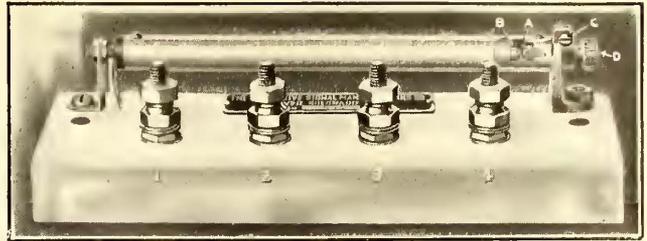
The heaters used are of the Peter Smith type, and are equipped with 1/2-hp. blower motors.

They are employed in cars formerly equipped with as much as 15 1/2 kw. capacity in electric heaters.

### A Thermostatic Time Element

A device designed to operate in connection with a relay and intended for use with any electrical circuit where it is desired to operate a time element for any specified time interval of from thirty seconds to five minutes has recently been placed on the market by the Protective Signal Manufacturing Company, Denver, Col. This operates upon the principle that a rod of metal when heated by an electric current of a certain amperage will increase its length by a given amount in a given time, and will thus make possible the closing of a pair of contacts at any desired time after current is first applied to the heating coil.

In the device there is an operating rod that is wound



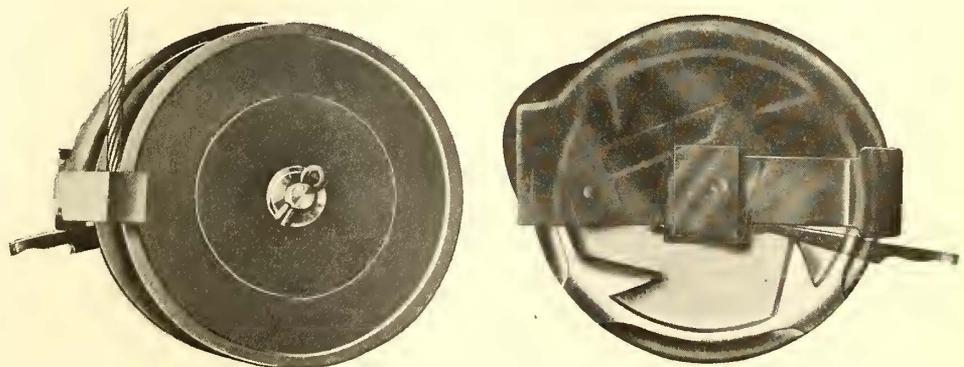
ELECTRIC TIME ELEMENT

with high-resistance insulated wire through which a current of electricity is passed, thereby generating heat and causing the rod to expand. After a known time interval the end of the rod makes contact with an adjusting screw. As soon as the contact is made the relay is energized and the outside controlling circuit is closed. The thermostatic circuit is thereby opened, allowing the thermostat to cool and the operating rod to return to its normal position.

The heating or operating unit is inclosed within a dustproof and moisture-proof casing and is protected from the outer casing by an insulated heat-resisting tube. It is not affected by the surrounding temperature of the atmosphere, owing to the fact that the two basic metals that are used in the construction are of the same density and of similar characteristics so that expansion and contraction due to atmospheric changes is the same for both metals. The device can be wound for any voltage from 6 to 110. Adjustment of the time interval is determined by the distance between the contact points at the end of the operating rod and at the end of the adjusting tube, depending primarily, of course, upon the amount of current applied which is constant in any particular installation. The adjusting screw is equipped with a micrometer thread and the screw can be withdrawn, increasing the space between the two contacts until the desired time is consumed between the application of current and the closing of the contact. The over-all dimensions of the unit are 8 in. x 2 1/2 in. x 2 1/2 in., and it weighs 2 lb. complete.

### A Simplified Trolley Catcher

The "Q-P" trolley, manufactured by the Q P Signal Company of Needham Heights, Mass., now being sold exclusively by the Lord Manufacturing Company, New York City, is a simplified device that has been perfected to reduce the maintenance costs that have frequently been involved with such devices. There are actually only four principal parts that are essential to the operation of the apparatus, these being a rope reel that is cast integral with the square centrifugal hub and the ratchet, the housing, the pawl, and the involute tension spring. The ratchet teeth are deep and substantially



GENERAL VIEW OF SIMPLIFIED TROLLEY CATCHER AND PHANTOM VIEW SHOWING MECHANISM

designed, and the open rope reel affords easy access to the trolley rope, eliminating the chance of interference by snow and ice. Among the distinctive features are the quick action of this device (catches after a rise of only  $4\frac{1}{2}$  in. above the trolley wire), the weight of only  $10\frac{1}{2}$  lb., the simplicity that accompanies the use of only four principal parts, and an automatic lock which operates when the catcher is removed from its socket, thus preventing any possibility of injury to passengers or employees or damage to the trolley catcher or to other parts of the car equipment.

### Single-Truck, Center-Entrance, Low-Step Car at Glens Falls, N. Y.

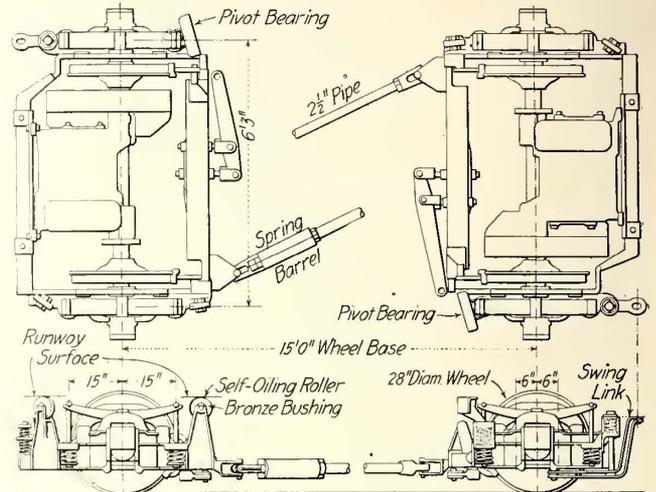
Through the courtesy of A. E. Reynolds, general manager Hudson Valley Railway, Glens Falls, N. Y., the Laconia Car Company, Boston, Mass., is demonstrating the operating advantages of its stepless center-entrance car. This car was placed in service on Nov. 30, and it is planned to have it remain in Glens Falls for about one month during which period it will be operated over one of the lines, at all times of the day and night, to demonstrate its ability to meet all kinds of physical and service conditions.

The low-step doorway, the center-entrance feature and the thoroughly modern equipment of this car has attracted very favorable notice among the Glens Falls public. The car is especially popular with the old and infirm, many of whom have told the conductors that they would be willing to travel downtown regularly if the car were to continue in operation in their district.

The principal dimensional figures on this car may be summarized as follows: Length over all, 33 ft.; width, 8 ft. 2 in.; height, only 10 ft.; wheelbase, 15 ft.; wheel diameter, 28 in.; clear width of doorways at center of car, 3 ft. 3 in.; step from pavement to car well, 14 in.; inside step to longitudinal aisle,  $11\frac{1}{4}$  in.; number of seats, 44; width of cross-seat,  $35\frac{1}{2}$  in. The present weight of the car at Glens Falls is 26,000 lb., but even with the present motor and air brake equipment the weight can be brought to 24,200 lb., or less than 550 lb. per seated passenger. Reductions are possible in the weight of the trucks by omitting the emergency doors at the ends of the car, which are not required, and also by omitting the pockets for the center-entrance doors. In ordering cars of this type it will be optional

with the purchaser to use double outside folding doors or outside sliding doors.

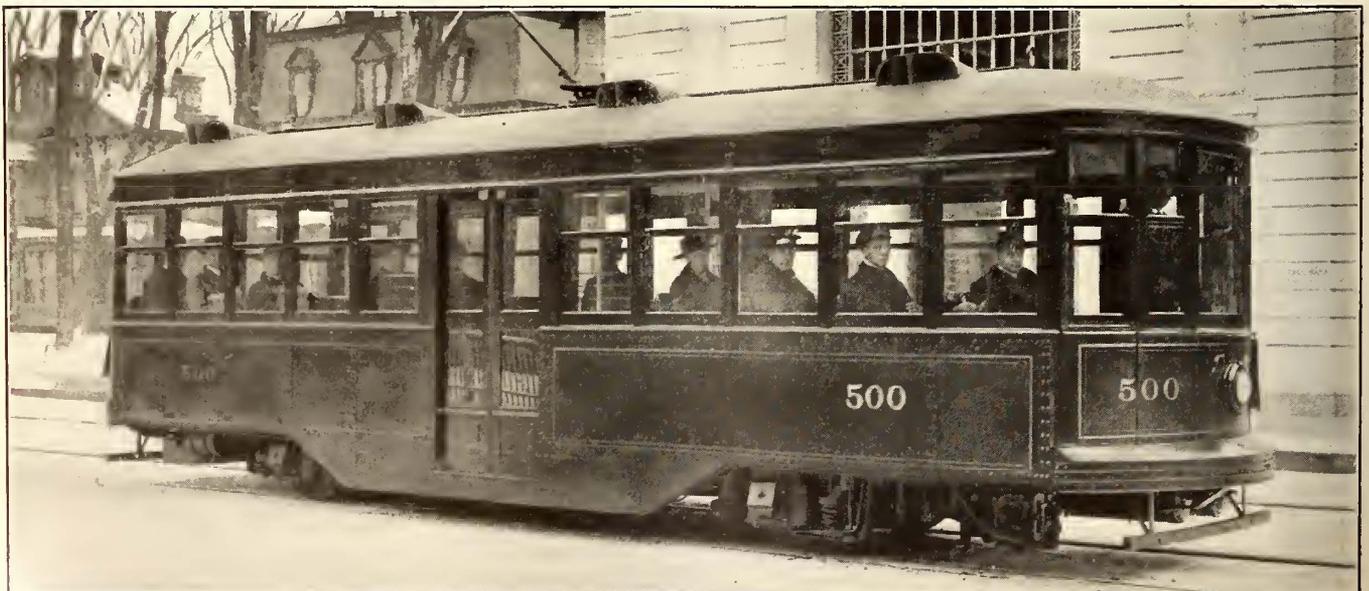
The radial-axle truck, which is built under license from the Philadelphia Holding Company, has a 15-ft. wheelbase and is of forged steel throughout. One of its most important features is the care taken to make



NEW LOW-STEP CAR—FIG. 1—GENERAL LAYOUT OF TRUCK

use of standard double-truck car parts such as journal boxes, wedges, bearings, brakeshoes, wheels and axles. The brake applications also are made just as on a double-truck car with no tendency to throw the axles out of alignment. As shown in Fig. 1, this truck is really a pair of single-axle trucks because the diagonal bar which connects them is simply a safety appliance with a reciprocating joint therein to allow for uneven action in going over special work, in and out of curves, over rough track and the like. Each truck is capable of throwing the axle 18 in. out of its normal center line.

Attached to each truck on the pivot side is a swing link fitted on the bottom with a half-ball joint on the end of a suspension hanger. The upper end of this swing link is pivoted to the car body and the lower end is pivoted directly under the journal box on the pedestal tie. On the opposite end is the pivot which is connected to the car body. Under this pivot is a spring acting in conjunction with a frictionless bearing to allow free radiation of the truck without bringing any torsion on the springs. Fig. 2 shows the pivot side of this truck



SINGLE-TRUCK, CENTER-ENTRANCE, LOW-STEP CAR AT GLENS FALLS, N. Y.

in side elevation and an end view or section through the link. The heavy line in the diagram shows this link in its normal running position on tangents, while the dotted line shows its position when the truck is in the middle of a 35-ft. radius curve. In the section the link is represented by the letter *E*, the suspension hanger

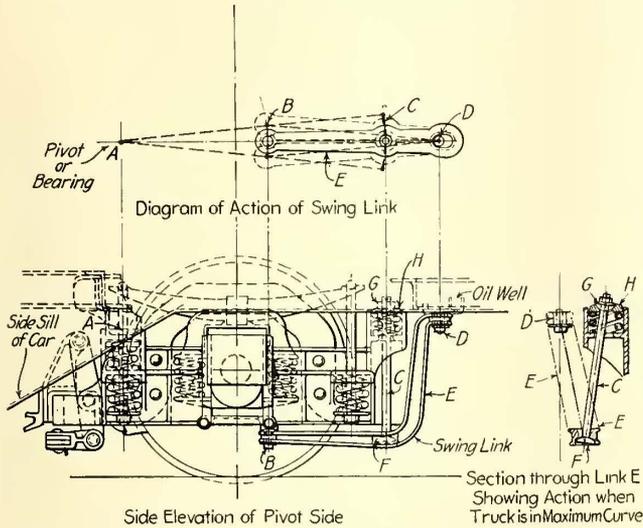
second pair of helical springs parallel to and outside of the first pair of helical springs. The inner helical springs take the jar or impact of wheel movement, which is absorbed finally by the semi-elliptic springs; the outer helical springs are designed to care for the ordinary vibration of the car body.

The motors are hung as on standard trucks so that they have no other duty than to propel the car. They are not required to take the thrust of operating around curves or the stresses due to braking.

On the whole, the motion of the car is found to be non-galloping and non-nosing. The wheels have an easy, natural movement, which does not cause abnormal binding on the rail or special work.

The following equipment is included on this car:

|                                             |                   |
|---------------------------------------------|-------------------|
| Air brake (Featherweight) . . . . .         | Westinghouse      |
| Anti-climbers . . . . .                     | Hedley            |
| Buzzers . . . . .                           | Consolidated      |
| Curtains . . . . .                          | Curtain Supply    |
| Hand straps . . . . .                       | Rico Sanitary     |
| Headlights . . . . .                        | Neal              |
| Heaters . . . . .                           | Consolidated      |
| Heat deflectors . . . . .                   | Consolidated      |
| Motors, 40 hp. with P. K. control . . . . . | Westinghouse      |
| Sand boxes . . . . .                        | Kilburn           |
| Seats . . . . .                             | Heywood-Wakefield |
| Stanchions . . . . .                        | Ellicon           |
| Starting signal . . . . .                   | Consolidated      |
| Thermostat . . . . .                        | Consolidated      |
| Ventilators . . . . .                       | Automatic         |
| Wheels . . . . .                            | Griffin           |



NEW LOW-STEP CAR—FIG. 2—DETAILS OF SUSPENSION AND LINK

by *C*, the half-ball joint by *F*, the nut at the top by *G* and the spring follower on the top of the spring, working in conjunction with *G*, by *H*. This section shows the relative position of link and hanger on a maximum curve.

The frictionless ball joint is represented by *B* and the sliding fulcrum point on the car body by *D*. Casting *D* is lubricated by means of an oil well similar to that used on the later type of motors. The swivel or pivot is shown at *A*. The bearing casting is secured to the cross-member of the car as in the case of an ordinary center plate.

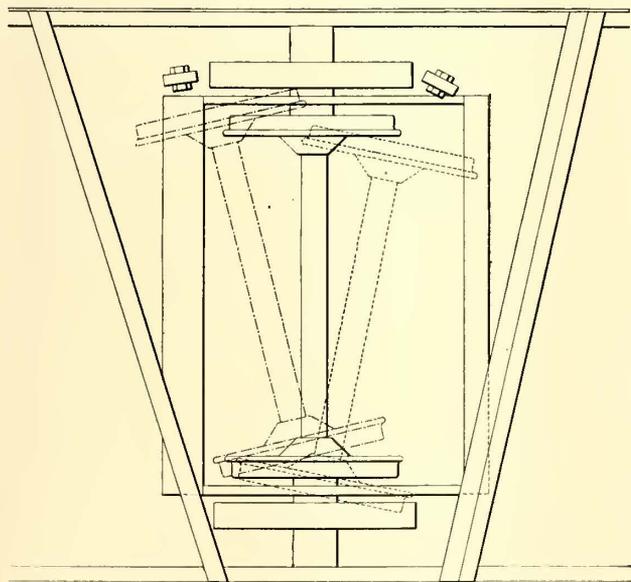
The movement set up between the body spring hanger and the frictionless pivot when the car enters and leaves a curve is shown in an accompanying drawing, Fig. 3.

The spring system is another most original feature. On each side of a journal box is a pair of helical springs which carry a saddle upon which a semi-elliptic spring is mounted. From the ends of this saddle extend a

### Cost of Roadway Machinery and Tools

In the cost sheets filed by the Bay State Street Railway of Boston, Mass., with the Massachusetts Public Service Commission in connection with the pending fare case are given the company's investments in roadway machinery and tools, as of Nov. 1, 1914. Extracts from these costs are tabulated below, the figures representing the cost of the equipment in the field, exclusive of overhead charges during installation.

| Item                                                        | Unit Cost |
|-------------------------------------------------------------|-----------|
| Wharton portable crossover, 110-lb. rail . . . . .          | \$825     |
| Wharton portable crossover, 60-lb. rail . . . . .           | 385       |
| No. 4 Duntley electric track drill . . . . .                | 254       |
| No. 3 Duntley electric track drill . . . . .                | 142       |
| Gore drilling machine . . . . .                             | 112       |
| Screw girder rail bender . . . . .                          | 61        |
| Motor-driven reciprocating track grinder . . . . .          | 1,805     |
| Indianapolis portable electric welder . . . . .             | 505       |
| Sherburne No. 2 rail bender . . . . .                       | 89        |
| Victor portable rail saw . . . . .                          | 50        |
| Acme motor-driven stone crusher and equipment . . . . .     | 1,788     |
| Type 21 American Steel & Wire Company track drill . . . . . | 111       |
| Seymour portable rail grinder . . . . .                     | 555       |
| Type 22 American Steel & Wire Company track drill . . . . . | 151       |
| No. 6 Bryant rail saw . . . . .                             | 126       |
| Electric hammer . . . . .                                   | 165       |
| Emerson bending machine . . . . .                           | 130       |
| 14-in. portable rail saw . . . . .                          | 50        |
| Stow portable rail grinder . . . . .                        | 327       |
| Hydraulic girder rail bender . . . . .                      | 365       |
| Sherburne girder rail bender . . . . .                      | 153       |
| No. 12 Smith motor-driven concrete mixer . . . . .          | 1,397     |
| 4-in. Worthington centrifugal pump . . . . .                | 467       |
| Carey motor-driven saw bench . . . . .                      | 398       |
| Buffalo portable forge and blower . . . . .                 | 33        |
| Contractor's derrick . . . . .                              | 81        |
| 3-hp. Stow electric track grinder . . . . .                 | 352       |
| 24-ft., 500-lb. pile driver . . . . .                       | 141       |
| No. 14 Ransome motor-driven concrete mixer . . . . .        | 740       |



NEW LOW-STEP CAR—FIG. 3—DIAGRAM SHOWING DISPLACEMENT OF AXLE ON CURVES

A point worthy of note in connection with the testing of cables having large thicknesses of dielectric is the difficulty of determining with certainty whether or not some water has entered through a flaw or other damage to the lead covering. The hydraulic test at 100 lb. per square inch reduces the risk, but the whole matter is one of degree. An amount of water that would ruin many yards of low-tension cable may be distributed among a few of the outer layers in a thick dielectric, and its path of least resistance will be longitudinal rather than radial. Under these conditions it is a matter of actual experience that electrical tests may entirely fail to indicate the presence of water, although this may exist in sufficient amounts to cause trouble when it has had time to distribute itself.

# News of Electric Railways

## COMMISSION INQUIRY TAKES NEW TURN

### Story of Attempt to Influence Signal Contract Awards for the New Rapid Transit Lines

The Legislative investigating committee inquiring into the workings of the Public Service Commission for the First District of New York took up during the week ended Dec. 18 the connection of Commissioner Wood with the letting of the contracts for signals for some of the new rapid transit lines.

On Dec. 15 the investigation took an unexpected turn. On that day Walter D. Uptegraff, president of the Union Switch & Signal Company, of Swissvale, Pa., testified that the board of directors of his company had refused in July, 1914, to pay \$5,000 to Sidney G. Johnson, vice-president, in charge of sales of the Union, which sum Mr. Johnson is said to have told Mr. Uptegraff he wanted to give to Commissioner Wood in order to induce Mr. Wood to vote for the Union system of signals on the Center Street loop of the new subway. Following this incident, Col. H. G. Prout, then president of the company, and Mr. Johnson resigned. Mr. Uptegraff also testified that shortly before Commissioner Wood became a member of the Public Service Commission the Union Switch & Signal Company, at Mr. Johnson's suggestion, paid him \$1,500 for helping the company to secure a contract with the Kansas City, Clay County & St. Joseph Railroad. The cancelled check that figured in this transaction was entered in evidence.

On the same day Travis H. Whitney, secretary of the commission, testified as to the proceedings in the letting of the signal contracts, their dates, the conferences on the subject, etc., the questions asked Mr. Whitney being directed toward building up the case against the commissioner.

On Dec. 16 Mr. Johnson, who is now vice-president of the General Railway Signal Company, was a witness. He accused Mr. Wood of demanding \$5,000 from the Union Switch & Signal Company for using his influence as commissioner to give that company the contract for installing the signal system in the Center Street Loop. Mr. Johnson said that he told Mr. Wood that he (Johnson) had no authority to talk with Mr. Wood on a matter of that kind and that on this account he could not say what could be done. Mr. Johnson said that he merely transmitted to the directors the proposal that had been made of a payment in the interest of Mr. Wood. The directors promptly rejected it. Mr. Johnson and Mr. Uptegraff have been subpoenaed to appear before the grand jury and tell their stories.

Colonel Prout would not discuss the matters in anticipation of his appearance before the committee as a witness.

Commissioner Wood denied to the newspapers the story as told by Mr. Johnson. He said:

"Johnson's story is absolutely false. It is all news to me, and I know nothing about it."

## MR. BAMBERGER'S TRIP EAST

Julian Bamberger, president Salt Lake & Ogden Railroad and vice-president Salt Lake Terminal Company, Salt Lake City, Utah, returned recently to Salt Lake from a visit of more than a month in the East. In anticipation of the erection in the near future of a joint terminal depot for the Orem and the Bamberger electric lines in Salt Lake, Mr. Bamberger spent a goodly portion of his time inspecting the terminal facilities of the interurban systems in the larger cities. His report will be considered by the directors of the terminal company.

While away Mr. Bamberger placed an order for six all-steel passenger coaches for the Salt Lake & Ogden Railroad, especially for the travel to the Lagoon summer resort, which is located on the line. These cars will have a seating capacity of eighty passengers. They are expected to be delivered not later than May 1.

Mr. Bamberger also made a study of block signal systems, as the company of which he is president expects some time during the coming summer to install automatic block signals on the sections of single track still remaining between Salt Lake and Ogden.

## THREE-WIRE DISTRIBUTION FOR SPRINGFIELD

The Springfield (Mass.) Street Railway has decided to convert its present overhead trolley circuits to the three-wire system, following an investigation of electrolysis conditions in the city by the United States Bureau of Standards. The bureau advised the change and upon receipt of its report the company employed the Stone & Webster Engineering Corporation, Boston, Mass., to study the situation and discuss the recommendations of the government engineering experts. Stone & Webster agreed with the conclusions of the bureau. In announcing the company's plan to change over the system, Clark V. Wood, president, said:

"Instead of sending current out from the power station to the trolley wire and returning it through the tracks and negative return, that is, making the trolley positive and the track negative, the trolley is split up into insulated sections, connected alternately with the positive and negative side of the system. With this system the current is delivered from the power station to the positive sections of the trolley and returned through the negative sections of the trolley and the feeders to the power station. The main current does not return to the power station through the rail, the only current in the rail being from the rail in the positive trolley sections to the rail in the negative trolley sections, so that the only current returned to the power station through the rail would be a small one due to the load on the positive sections being greater than the negative, or vice versa. The effect of this arrangement is much the same as would be obtained by a large number of small substations. This system has been in operation for a number of years in Europe, especially in Germany. This work will be done in conjunction with the Bureau of Standards. Mr. McCollum of that bureau recently said before the Western Massachusetts Association of Electrical Inspectors that the three-wire system possesses some very attractive features."

Work on the reconstruction of the overhead system will begin immediately. The exact cost of making the change and the length of time that will be required to complete the work are not known.

## I. C. C. REPORT PRESENTED

### Commission Wants to Enlarge—Recommendation Renewed Regarding Control Over Capitalization

The annual report of the Interstate Commerce Commission, made public on Dec. 13, contains, in addition to complete details of decisions rendered and court cases involving its decisions during the year, a comprehensive statement on the progress being made in the work of valuation of railroads throughout the country. The commission, in its recommendations, calls attention to the fact that the variety and volume of work already devolved upon it necessitate early enlargement of its membership and express statutory power to act through subdivisions.

The commission renews its recommendations that there should be provided by law one period, preferably three years, for the beginning of all actions relating to transportation charges subject to the commission act; that the commission should have right of access to carriers' correspondence files; that there should be appropriate and adequate legislation upon the subject of control over railway capitalization; that the minimum penalty for violation of the hours of service act be fixed at \$100, and that the use of steel cars in passenger service be required and the use in passenger trains of wooden cars between or in front of steel cars be prohibited.

The progress and character of the work of the commission on the valuation of railroads is dealt with exhaustively. The last report stated that eight roadway and track parties had been organized in each of the five districts into which the country has been divided for the purpose of valuation work and that the total mileage covered was from 1500 to 1700 miles per month. It was further stated that the number of parties would probably be increased to sixteen or twenty. It was believed that the overhead organization

should handle approximately 50,000 miles per year and that this number of parties would be required to accomplish that mileage.

### BALTIMORE COMPANY REPLIES TO COMMISSION

#### Letter of President House to Commission Discussing Wheelguards, Vestibules, Etc.

The United Railways & Electric Company, Baltimore, Md., through William A. House, the president, has addressed the Public Service Commission of Maryland with respect to the recent report of Bruce W. Duer and Charles E. Phelps, Jr., transportation expert and chief engineer, respectively, of the commission. Except for the salutation the letter of Mr. House follows in full:

"I wish to state that this company has given the fullest consideration to the recommendations made in the report of Messrs. Duer and Phelps. While we have endeavored to make clear the position heretofore taken by the company with respect to the wheelguards with which its cars have been equipped—this type of wheelguard being the best adaptable to the character of paving (cobblestone) prior to the operations of the paving commission, upon the streets traversed by its cars—we are now willing and prepared to install upon the cars one of the latest approved types of wheelguard, and will proceed with this installation at first upon those lines throughout which the improved pavement has been laid, completing the work by Dec. 31, 1916.

"With respect to the fenders, to which Messrs. Duer and Phelps refer, while the minor alteration suggested by them is considered by the company's officials as more or less of a refinement, we will be pleased to meet their wishes and make the changes suggested coincident with the work of installing the wheelguards.

"As to inclosing the platforms of the semi-convertible, open platform equipment, you, of course, are aware that this company purchased and placed in service, during the latter part of 1914, upon its St. Paul Street, Linden Avenue and West Arlington lines, the inclosed platform type of semi-convertible cars.

"You also doubtless recall my statement before your honorable commission, at the time this company obtained permission for the issuance of its \$1,000,000 of 5 per cent notes, in June, 1914, that it was the company's purpose gradually to inclose the platforms of its cars, and that part of the proceeds of this note issue was to be used for this purpose, beginning in 1915.

"In view of the industrial, financial and commercial depression, however, which 'set in' in the fall of 1914, it was deemed advisable by the management to curtail any expenditures other than those necessary to maintain the physical condition of its property and equipment at the highest standard of efficiency. It, therefore, deferred taking any steps looking to the prosecution of this work.

"In view of the encouraging business outlook and as Messrs. Duer and Phelps, in their report above referred to, have recommended that these platforms be inclosed, and, further, as it is the desire of the management again to take this question up, the company will proceed to inclose all the vestibules of its semi-convertible, open platform cars.

"We regret, however, that we do not agree with Messrs. Duer and Phelps as to the time within which this work may be accomplished, particularly in view of the fact that it must be done at the company's shops in conjunction with the general maintenance and repair work of equipment, and we find, after most earnest and careful consideration of the matter, that it is impossible to make the alterations in these cars faster than twelve a month. Moreover, to comply with the recommendation of Messrs. Duer and Phelps would require the withdrawal of too many cars from the service at one time, with resultant inconvenience to the traveling public. We will, therefore, beginning April 1, 1916, the interval between the present time and the date named being necessary to organize shop forces, prepare patterns, and work out incidental details, take in hand the work of vestibuling all the semi-convertible, open platform cars and prosecute it at the rate per month above stated. We trust that the above will meet with your approval and that we shall be so advised."

### HYDRO-RADIAL BY-LAW BEFORE TORONTO VOTERS ON JAN. 1

After discussing the subject for nine hours, the City Council of Toronto, Ont., on Dec. 8, by a vote of eighteen to four, decided to submit the hydro-radial by-law to the people on New Year's Day. If the taxpayers are content to allow the city to guarantee bonds to the amount of \$4,240,000 and other municipalities do likewise for their respective share of the cost of the proposed undertaking, estimated at \$13,734,155, the Hydro-Electric Power Commission of Ontario will proceed to construct an electric radial railway from Toronto through western Ontario.

The principal point at issue, so far as Toronto is concerned, according to the discussion, is whether that section of the radial line within the city limits should be under the control of Toronto or the Hydro Commission. This point became especially prominent owing to the fact that the proposals of the Hydro Commission conflicted with the recommendations made by the engineers who prepared the local Toronto transit report referred to in the *ELECTRIC RAILWAY JOURNAL* of Dec. 11, page 1183. Works Commissioner Harris, in addressing the Council regarding the recommendations of the local traffic commission, said it was of paramount importance that the city should have absolute control over all electric railway lines within the limits of the city. If the hydro-radial plan were adopted the recommendations made by the local engineers would have to be considerably modified. Instead of the city having control over the radials entering its borders, that power would be in the hands of the Hydro Commission.

F. A. Gaby, the hydro engineer, explained that the Hydro Commission would secure a right-of-way along the water front sufficient for four tracks, and adequate for the accommodation of the civic lines. There would be absolutely no need for duplication. The only difference would be that the Hydro Commission would control the radial lines as trustees for the owners, the people residing in all municipalities served by the lines. So far as the initial cost was concerned, the estimates in both reports were identical. Toronto would have to pay the cost of the lines and terminals constructed within its borders and its proportionate share of the cost of the main lines. The only point of difference was that of control, and the Hydro Commission desired that Toronto should have absolute control over its own transportation system and leave the radials to the commission.

Regarding the existing radials, Sir Adam Beck stated that the owners of all of them, from Windsor on the west to Prescott on the east, had approached the Hydro Commission with reference to buying them out. If it was the desire of the people of Toronto to acquire the Toronto & York Radial Railway, Metropolitan Division, they should seek the co-operation of the outside municipalities and request the Hydro Commission to endeavor to acquire the line. He further stated that should the commission acquire the Guelph line of the Toronto Suburban Railway, there would be no necessity to construct the line along the water front at the present time, as the owners of that line had the right to enter the city by way of Bathurst Street. The commission, however, would have to build the water front line when it constructed a radial line to Hamilton.

During the discussion it was disclosed that the traffic report prepared by Messrs. Harris, Gaby and Couzens for Toronto would cost the city approximately \$50,000. The decision of the Council to support the hydro-radial scheme means that this report will probably be shelved for some time. It was decided to refer the city report to the special committee on transportation, but in view of the fact that no action can be taken on any of the recommendations made until after January it is unlikely that anything more will be heard of the city report until some time next year.

Final details in connection with the hydro-radial by-law were dealt with at a special meeting of the Mimico Village Council on Dec. 7. Everything was explained to the satisfaction of the Council and the by-law was passed on second reading. In Stratford the by-law has had the first two readings and been sent on to the ratepayers. The Berlin City Council and Waterloo Town and Waterloo Township have voted in favor of submitting similar by-laws.

## ALBANY ARBITRATION DECISION RENDERED

### Arbitration Board Refers to Differences as Trivial and Condemns Strike as Unwise

The committee composed of Lynn J. Arnold, Cornelius F. Burns, Mayor of Troy, and William E. Woollard, which was appointed to settle the dispute between the United Traction Company, Albany, N. Y., and its employees, rendered its decision on Dec. 11. The committee declared unanimously that, under the disputed section of the agreement, the company had the right to dispose of complaints through a general superintendent or division superintendent; that the method of C. A. Coons, the general superintendent, did not violate the agreement, except that in cases involving suspension of employees it was established that the men had been denied the right of a personal hearing before the general superintendent.

The arbitrators concluded their finding as follows:

"We find from the agreement and from the evidence and statements before us:

"1. That under Sec. 6 of the agreement the company had the right to dispose of all complaints against its employees in the first instance, through a hearing and determination by the general superintendent or by a division superintendent.

"2. That the new method of procedure in discipline cases instituted by Mr. Coons did not violate the provisions of Sec. 6, except as stated in the third finding.

"3. That in the cases heard by a division superintendent, reported by him to the general superintendent and decided by the general superintendent, directing suspension, there was a violation of the provisions of Sec. 6 in that the employee was denied the right of a personal hearing before the general superintendent. In other words, we hold that each employee has the right to be heard in person and with counsel, by the official of the company who is to give judgment of suspension, before such judgment is passed.

"The public interests require that we should say this in conclusion:

"There was no necessity for a strike. The calling of a strike was unwise. It caused great inconvenience to the general public. If the trivial differences could not have been settled by conferences between the parties directly interested, they should have been settled by arbitration before calling a strike. Public service corporations and their employees must remember that they are not the only parties in interest. There is a third party to be considered, the public, who, by their nickels, support the transportation corporation, and thereby support the employees of such a corporation."

## FASTER SCHEDULES IN BUFFALO—OTHER IMPROVEMENTS

As the result of a recent conference between E. G. Connette, president of the International Railway, Buffalo, N. Y.; E. J. Dickson, vice-president; N. H. Brown, general superintendent of transportation, and T. W. Connette, superintendent of the Buffalo city lines, a faster car schedule has been put into effect and seventy cars have been added to the various lines throughout the city.

Two new substations are now in course of construction, and \$150,000 will be spent to increase the capacity of the five substations now in operation. In the spring three more plants will be added to the equipment of the International Railway, making ten substations located in widely separated parts of the city.

A new heating system has already been installed in 360 cars. Heaters are being placed near the conductors, who stand just inside the car in the near-side type of pay-as-you-enter cars, and in the front vestibule. Since April 1 the company has spent more than \$1,250,000 in bringing the service, roadway and equipment up to the highest possible standard of efficiency.

Commenting on the comprehensive plan for the improvement of the service, Mr. Dickson said:

"During April 1 and Dec. 1 much track was reconstructed, new paving laid, single tracks made double and other improvements carried out. Service on these streets has been greatly improved; Linwood Avenue; Grider Street, new double tracks; Harvard Place; Delavan Avenue; Abbott Road; Niagara Street; West Ferry Street;

Allen Street; Military Road, and Elmwood Avenue. Improvements have also been made at Niagara Falls, N. Y., and at Tonawanda, North Tonawanda and Lockport. In all we have spent more than \$1,250,000 in bringing the service, roadway and equipment up to the highest possible standard of efficiency."

The company is seeking permission from the Council to construct an extension across the southerly half of Kenmore Avenue between Kenmore Avenue and Main Street.

## PRESIDENT LILIENTHAL'S COMMANDMENTS

Jesse W. Lilienthal, president of United Railroads, San Francisco, Cal., has adopted five commandments which he says must rule dealings of himself and his employees with the public. They are:

Accept loyally and without reservation the now universally proclaimed doctrine that a public utility is the servant of the people. Our courts of last resort have so declared.

Give affairs of the public utility the widest publicity. The public is entitled to know what you are doing and how you are getting along.

Treat your employees fairly and, so far as your resources will permit, generously.

Keep out of politics. I realize how great the temptation is to do just the contrary, for the public utility is the target for the politician.

Appeal to the public for fairness and justice. Deem it your right and duty to influence public opinion. Complain of the wrongs done you. Expose the methods of corrupt or unfair politicians. Combat the arguments of muckrakers and pseudo-reformers. Never allow an untrue charge to remain unchallenged. Circularize the public.

## STORM DELAYS TRAFFIC

### New Haven's Electric Zone Prostrated—Many Suburban Trolleys Suspend

The storm which prevailed over the Central West and the Great Lakes district during the latter part of the week ended Dec. 12 moved eastward and extended over almost the entire Atlantic coast on Dec. 13 and 14. It seems to have spent its fury, however, in the Hudson River Valley between Albany and New York and in the New England States west of Springfield, Mass.

The storm was ushered in with rain and a falling temperature. Then followed snow and an increase in wind velocity so that very unusual conditions were presented. On Dec. 14 Albany reported 20 in. of snow. In New York the fall averaged only 7 in. On the morning of Dec. 14 New York, Brooklyn, Staten Island and suburban New York reported practically all lines in operation.

The most complete suspension of service in New York was on the lines of the New York, New Haven & Hartford Railroad. This company did not begin to return to normal conditions until after noon on Wednesday. The electric zone was practically out of business, the few trains that were run being hauled by steam locomotives. The storm seemed to be the most severe between New Rochelle and Stamford, or 20 to 25 miles along the electrified main line of the New Haven. Here many poles carrying telegraph and telephone wires were blown down. Heavy transmission lines for electric current and contact wires were either burned in two or grounded in five places. Signal wires at many places were down, requiring trains to move slowly. Between New Haven and Boston the storm was not quite as heavy and the line was more nearly in a normal condition. On the other hand the New York Central Railroad succeeded in keeping open its electric zone to Harmon, and the New York, Westchester & Boston Railway was affected only for a few hours through the failure of its power supply from the New Haven road.

In Albany trolley traffic was blocked during the rush hours on the evening of Dec. 13. Electric railway traffic from Albany to Troy was stopped shortly before midnight on Dec. 13. The Cohoes, Green Island and Lansingburg lines also were stalled. Traffic on the Schenectady-Albany line was intermittent. The Albany Southern Railway had to cancel several trains. In Rensselaer the cars were kept running but nowhere near schedule time.

Reports from Troy, Schenectady, Gloversville, Poughkeepsie, Glens Falls, Pittsfield and other cities indicate conditions in those places varying for the most part but slightly from those experienced in Greater New York and Albany.

#### TERMINAL IMPROVEMENT PLANS FOR LOS ANGELES COMPLETED

Plans for elevated tracks and terminal improvements for the Pacific Electric Railway have been completed and the scheme has been approved by the Board of Public Utilities, which had previously ordered the company to execute, on or before July 1, 1916, whatever work was deemed necessary to relieve congested interurban traffic. An elevated steel structure approximately 2000 ft. long, carrying three tracks, will be erected along Sixth Street from the station at Main Street to San Pedro Street. Elevated loading and unloading platforms will parallel these tracks for about 1100 ft. These will support steel and reinforced concrete umbrella sheds, will have reinforced concrete decks and will be connected to the elevated tracks by steel and reinforced concrete bridges. Extensive alterations to the passenger station will be necessary to carry out the scheme. Exclusive of signal systems and tracks the cost is estimated at \$166,000. It has not been decided whether the general structural work will be done by contract, but bids for steel and other materials are now being taken. For immediate relief of the congestion of traffic temporary tracks and sheds to cost about \$7,000 will be constructed near the station. Plans are also being prepared for an umbrella shed and rearrangement of tracks at the western division station on Hill Street near Fourth Street.

#### MORE PEACE TALK IN WILKES-BARRE

Continued efforts to arrive at some definite solution acceptable to both sides in the Wilkes-Barre (Pa.) Railway strike have marked the work of the peacemakers. No attempts at violence have been made recently, except an attack by twenty armed men on the power plant of the company which has been used as a barracks for the men replacing the strikers. The disturbance took place in the dark of early morning, and while a shower of lead was poured into the building no serious damage was done and no one was injured. A number of policemen were quickly on the scene and dispersed the mob. No arrests were made.

The latest development in the peace proposals was a conference of two hours between T. A. Wright, general manager of the Wilkes-Barre Railway, and W. D. Mahon, president of the Amalgamated Association. This meeting was later followed by two others, and it is said that much progress was made toward settling the strike. It is understood that the company insists that the legality of the repudiation of the wage award by the arbitrators be adjudicated by a court, a judge or a lawyer. The men in return are asking, it is said, for a discipline clause which will protect the strikers from discrimination if peace comes.

#### PHILADELPHIA TRANSIT LOAN ELECTION ON FEB. 8

Ninety million dollars will be borrowed by the city of Philadelphia, Pa., subject to the approval of the people, to finance municipal improvements and developments to be inaugurated or continued during the next two years, under the terms of a loan ordinance introduced into Councils recently and favorably reported by the finance committee. A special election will be held on Feb. 8, 1916, when the citizens will vote upon the proposed loan, which will greatly increase the city's indebtedness. Of the total amount to be borrowed, \$45,000,000 will be applied to the construction of the Broad Street subway and the Frankford elevated line, "and the construction of such other subway and elevated railways as shall be authorized by Councils."

To expedite the passage of the loan bill Councils unanimously adopted resolutions calling for stated sessions each Thursday until the end of the present year. Should any change be decided upon, the bill will be amended at one of the meetings. It was expected that on Dec. 16 the loan bill would pass both chambers. It is expected that Mayor Blankenburg will sign it without delay, and the thirty-day period for advertising will be ended in time for the election. In a message to Councils, sent before the loan bill was

reported, Mayor Blankenburg transmitted a request from Director of City Transit Taylor that a special election be held to consider a \$50,000,000 transit loan. The incorporation of \$45,000,000 in the \$90,000,000 will be satisfactory, it is believed. A. Merritt Taylor, director of city transit, says that with the amount asked it will be possible to complete the Broad Street, Frankford, Woodland Avenue and Parkway lines.

#### TENTATIVE SUBWAY PLAN IN PITTSBURGH

The City Council of Pittsburgh, Pa., has adopted a tentative plan for proceeding with the proposed downtown subway loop. A committee of the Council, in conference with the city law department, has prepared the following suggestions which, in the form of a resolution, will be presented to the newly-organized Council early in January:

1. Shall the city treat first with private corporations with the view of having the project undertaken by private capital on the basis of giving the municipality reasonable compensation for the franchise?

2. Shall we have an act prepared for introduction in the Legislature in 1917 authorizing the municipal ownership plan, and in the meantime seek to unite sentiment upon a measure and get through with as many of the preliminaries as possible?

3. Shall we, in the event of deciding upon municipal ownership, proceed at once to hold conferences with private corporations which might lease the subway with the view of securing agreements as to rental, etc.?

This discloses that the city does not have sufficient law now to build the subway itself and that a year's time, at least, would be saved by the private enterprise plan. There is ample authority now, of course, for building the tube privately.

It has been estimated that the proposed subway would cost about \$5,000,000. It is regarded as time for general recognition that the downtown subway is the first thing to be provided in any system for the relief of the traffic congestion. Differences over the plans for the building of a subway by the city resulted in the Governor vetoing two measures for that purpose passed at the last session of the Legislature.

#### CONVENTION OF AMERICAN ASSOCIATION OF ENGINEERS

At the first national convention of the American Association of Engineers held in Chicago, Dec. 10 and 11, 1915, Arthur Kneisel, secretary, reported that the membership had grown to 330 since the association's inception six months ago. F. H. Newell, professor of civil engineering, University of Illinois, and a former director of the United States Reclamation Service, addressed the association on the constructive work which an organization of all the engineers of this country could do. Other speakers were W. D. Wilcox, president of the association, G. Willard Rich of Rochester, N. Y., and J. H. Prior, chief engineer of the State Public Utilities Commission of Illinois. A banquet was held on the evening of Dec. 10.

#### FURTHER FRANCHISE DISCUSSION IN TOLEDO

Frank E. Seagraves, who has had forty years of experience in the construction and operation of city and suburban railways, spoke before the subcommittee of Mayor-elect Milroy's street railway committee at Toledo, Ohio, on Dec. 7. He declared that he had voted against the Dotson franchise because he believed it would have settled only one question, namely, the length of the grant. Mr. Seagraves urged that any franchise granted be put into language that can have but one interpretation, and that experienced railway builders be employed to make the valuation on which the fare shall be based. He urged a fair franchise for a term of twenty-five years, but expressed the opinion that the property was worth less than \$14,000,000, for which it is bonded. He thought that seven tickets for a quarter would be adequate. The Central Labor Union has adopted a resolution not to act in the street railway matter until the Milroy committee makes its report. A committee has been appointed by the City Council to communicate with the State Public Utilities Commission in regard to making an appraisal of the street railway property for franchise purposes.

**Operation Begun by Portland & Oregon City Railway.**—Operation has been begun by the Portland & Oregon City Railway, Portland, Ore., between Milwaukee and Carver.

**New Florida Line Opened.**—The Miami (Fla.) Traction Company has placed in operation the first section of its line. The system as at present proposed provides for 3½ miles of line.

**Can't Give Railway Away.**—The voters of Port Vue, Pa., have rejected the proposal of Gilbert F. Myer, general manager of the Port Vue Street Railway, who offered the 1-mile line of the Port Vue Street Railway to the borough with all equipment if the borough would agree to operate the line for five years.

**Appraisals for Rate Purposes Only in Ohio.**—The Public Utilities Commission of Ohio will make no more appraisals of public utility properties unless it is necessary to do so in order to determine rate contests. Under a law enacted last winter the commission may use its judgment as to making appraisals.

**Hearings Before Whole Commission in New York.**—On motion of Commissioner William Hayward, hearings before the Public Service Commission for the First District of New York will hereafter be set down for conduct before the whole commission, instead of being assigned to individual commissioners.

**Abandonment of Short Line Permitted.**—On an opinion by Commissioner Frank Irvine the Public Service Commission for the Second District of New York has permitted the Binghamton Railway to abandon its line on Glenwood Avenue between the intersection of Downs and Glenwood Avenue and Prospect Street in Binghamton. The track to be abandoned is about 600 ft. long.

**Lincoln Company Seeks to Suspend.**—The Lincoln Railway & Heating Company, Lincoln, Ill., has applied to the State Public Utilities Commission for permission to discontinue all street railway service in the city, upon the grounds that it is working under a daily loss and that debt is accumulating. No date has been set as yet for the hearing of the case by the State Public Utilities Commission.

**Strike on Depew Line Still in Progress.**—U. L. Upson, superintendent of the Buffalo & Depew Railway, Buffalo, N. Y., is acting as motorman and conductor on a car operating over the line between certain hours of the day. As previously reported in the *ELECTRIC RAILWAY JOURNAL*, the employees of the company are on strike for increased wages. Traffic has been abandoned for several weeks. No disorder has been reported.

**Extension of Time for Installing Signals on New York Elevated.**—The Public Service Commission for the First District of New York has adopted an order extending the time during which the Interborough Rapid Transit Company is to make an experimental installation of a system of signaling on the elevated railroads operated by it. The order directs the company to make such an installation by Feb. 1, 1916, and to report the result of the test to the commission by Aug. 1, 1916.

**Interurban Interested in Cincinnati Rapid Transit System.**—The receivers of the Interurban Railway & Terminal Company have requested permission to study the plans and reports pertaining to the proposed rapid transit belt line in Cincinnati. On Dec. 10 City Engineer Krug replied to a criticism made by W. L. Woodward of the plans now under consideration. Mr. Woodward contended that persons in certain parts of the outskirts would be forced to go down-town in order to reach other outlying points. Mr. Krug said that the surface lines, which are to be a part of the belt, will take care of this matter.

**Company Wins Brooklyn Third-Tracking Case.**—A decision favorable to the Brooklyn (N. Y.) Rapid Transit Company was rendered on Dec. 9, by ex-Judge Charles F. Brown, who sat as referee in the Fulton Street elevated railway third-tracking case, which was brought before him on the protest of property owners along the line of upper Fulton Street. Under ex-Judge Brown's opinion the railroad's solid girder type of construction is entirely legal, and the way is thus opened for the Public Service Commission to approve the plans for the third-tracking of the Fulton Street elevated line of the company below Nostrand

Avenue with the same type of construction as that used north of that point. All this work had been held up pending the decision of the referee.

**Report on Cleveland Railway Funds Requested.**—The Council of Cleveland, Ohio, has adopted Councilman Wood's resolution requesting a report from Street Railway Commissioner Peter Witt on the status of the Cleveland Railways operating, interest and maintenance funds, together with funds available for paying over-expenditures. According to the company the interest fund had shown an increase of \$200,036 for the last ten months, and by Jan. 1, 1916, about \$100,000 more will be added to it. Since March 1, 1913, a deficit of \$558,876 has accumulated in the maintenance fund. This is in the shape of over-expenditure and will have to go over to the new administration.

**Hot Springs Prosperity Week Celebration.**—The celebration that attended Electrical Prosperity Week at Hot Springs, Ark., the national health and pleasure resort, was perhaps the most elaborate of its kind ever held there. Stephen Mather, assistant secretary of the Interior, and Dr. W. P. Parks, superintendent of the United States Reservation, represented the government. The Business Men's League, the Merchants Association and all lines of trade took part in the parade on the night of Dec. 2. One of the features of the parade was the exhibition of the Hot Springs Street Railway, which had in line a mule-drawn street car used thirty years ago followed by a modern, double-truck car brilliantly illuminated with colored electric lights and occupied by young girls who sang patriotic songs.

**Seattle Litigation Ended by Court Decision.**—Judge Charles E. Claypool, in the United States District Court, in Seattle, Wash., has found judgment of \$41,700 against the city of Seattle, in favor of the Seattle, Renton & Southern Railway for the changing of the grades on Rainier Avenue. The plaintiffs, represented by William R. Crawford, former president of the Seattle, Renton & Southern Railway, claimed damages of more than \$400,000 as a result of the regrading. Judge Claypool also finds that the company should be required to adjust its tracks to the new grades of Rainier Avenue, without further payment from the city, and that the company is not entitled to any judgment for the paving of the 18 ft. of the center of Rainier Avenue, from Jefferson Street to the south city limits, but that under the provisions of its franchise it may be required to pave that 18 ft., with the same material and at the same time that the city paves the remaining portions of the street. The court held further that the Seattle, Renton & Southern Railway has no right to the exclusive use of the right-of-way on Rainier Avenue, between Jackson Street and Ryan Street, with the exception of that portion lying between Kenyon and Thistle Streets. This decision ends litigation that has been in progress for six years.

**Franchise Problems in San Francisco.**—M. M. O'Shaughnessy, city engineer of San Francisco, Cal., in a statement to the Board of Supervisors on Dec. 9 declared that there is no probability of an agreement being reached between the city and the United Railroads for the use of upper Market Street by the proposed Church Street municipal car line. Mr. O'Shaughnessy recommends that litigation be started to compel the company to give the city line the right to use this thoroughfare, as in the event of a different routeing being necessary the additional cost will amount to approximately \$110,000. The matter was taken up with the United Railroads by the Mayor and the city attorney early this year, but no satisfactory arrangement could be made. In response to an inquiry sent the United Railroads by the city on Nov. 3, it is reported that Jesse W. Lilienthal, president of the company, replied that the proposed method would mean a loss of \$157,935.50 per annum to his company; that his company is advised that the franchise under which it is operating forbids the use of United Railroad tracks, or the construction of parallel tracks by a foreign company for a distance of more than five blocks on any street; and that the very life of his company depends on the correctness of this view. The same issue will be brought up again when the Twin Peaks Tunnel is completed, the city engineer points out. He proposes that the city purchase the lines of the United Railroads where future municipal extensions are planned.

# Financial and Corporate

## ANNUAL REPORTS

### Chicago Elevated Railways Collateral Trust

The income statement of the Chicago (Ill.) Elevated Railways Collateral Trust for the year ended Dec. 31, 1914, follows:

|                                       |             |
|---------------------------------------|-------------|
| Dividends .....                       | \$1,109,798 |
| Interest .....                        | 718,250     |
| Gross income.....                     | \$1,828,049 |
| Interest on notes and debentures..... | \$1,310,000 |
| General expense .....                 | 33,350      |
| Total disbursements .....             | \$1,343,350 |
| Net income .....                      | \$484,698   |
| Dividends on preferred.....           | 480,000     |
| Surplus income .....                  | \$4,638     |

The report states that the \$30,000,000 of the three-year 5 per cent notes of the trustees, issued under date of July 1, 1911, matured and were paid on July 1, 1914. In order to raise the funds to make this payment the trustees sold the following securities: (1) \$12,500,000 of the first mortgage 5 per cent bonds of Northwestern Elevated Railroad, due in 1941, being part of the total issue of \$25,000,000 held by the trustees; (2) \$14,000,000 of two-year 5 per cent notes issued by the trustees under date of July 1, 1914, secured by a pledge of substantially all the capital stock of the Northwestern Elevated Railroad, the Metropolitan West Side Elevated Railway and the South Side Elevated Railroad; (3) \$7,000,000 of ten-year 6 per cent debentures issued by the trustees under date of July 1, 1914.

In connection with the sale of \$12,500,000 of bonds of the Northwestern Elevated Railroad above mentioned, the remainder of that issue (\$12,500,000) was deposited in escrow with the Central Trust Company, New York, under an arrangement whereby they can be released only against permanent improvements upon the property of the Northwestern Elevated Railroad and that company is relieved from paying interest on them until released.

The refinancing of July 1, 1914, together with the decrease in net earnings of the subsidiary companies (caused largely by decreased traffic and increased operating expenses), resulted in a diminished income to the trustees, and they felt obliged to discontinue payment of dividends on the preferred participation shares until conditions should improve. No dividends have been paid on those shares since June 1, 1914.

During the year the trustees acquired the following securities (exclusive of bills receivable of the subsidiary companies), which are included among the current assets: \$16,000 of Chicago & Oak Park Elevated Railroad equipment 6 per cent notes; \$504,000 of Chicago & Oak Park Elevated Railroad receiver's certificates; \$174,000 of Metropolitan West Side, Northwestern and South Side Elevated Railroad 5 per cent equipment trust certificates dated Aug. 1, 1914, Series "B," and \$1,000 South Side Elevated Railroad 4½ per cent bond.

The income statement of the trust above submitted does not indicate the full amount of the net earnings of the subsidiary companies, but only that portion which was received by the trustees by way of dividends from those companies. The combined income statement of the Metropolitan West Side Elevated Railway, the South Side Elevated Railroad and the Northwestern Elevated Railroad was published in the ELECTRIC RAILWAY JOURNAL of Dec. 4. The Chicago & Oak Park Elevated Railroad continues to be operated by Samuel Insul, as receiver, for the United States District Court.

### Eastern Pennsylvania Railways

According to the consolidated statement of income, profit and loss of the Eastern Pennsylvania Railways, Pottsville, Pa., and its subsidiary companies for the twelve months ended June 30, 1915, the gross earnings for the year were \$825,455, and operating expenses and taxes, \$486,570, leaving net earnings from operation, \$338,885. Interest and rental charges were \$227,783, giving a net profit for the year of \$111,102.

Compared with the year ended June 30, 1914, the gross earnings showed a decrease of \$960 or 0.12 per cent. The operating expenses decreased \$16,917 or 3.36 per cent, and the net profit for the year increased \$12,192 or 12.33 per cent. The earnings of the railway department decreased \$26,469 or 4.84 per cent, which was caused by the general depressed business condition prevailing throughout the territory served by the company, curtailment of mining operations, and jitney competition. This decrease was slightly more than offset by an increase of \$26,609 or 9.82 per cent in the earnings of the electric department, which is accounted for by an increased number of lighting and power contracts made during the year. The earnings of the gas department increased \$99 or 1.56 per cent, while the revenue from the park department decreased \$1,199 or 50.41 per cent.

During the year there was expended for maintenance \$123,437, of which \$82,485 was for the railway department, \$39,896 for the electric department and \$1,055 for the gas department. There was also charged to capital account during the year \$107,376 for the railway department and \$33,733 for the electric department, making a total of \$141,110.

### SECURITIES TO BE DISTRIBUTED

#### Bondholders' Protective Committee of Trenton, Bristol & Philadelphia Street Railway Will Divide Bonds and Stock Among Holders of Deposit Certificates

The bondholders' protective committee of the Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa., composed of John Redwood, Grier Hersh, S. C. Rowland, W. F. Sadler, Jr., C. N. Martin, W. A. House, C. T. Crane and Robert Toland, has concluded that the time has arrived to distribute the securities of the company among the holders of certificates of deposit representing bonds of the predecessor company. In August, 1909, the property and franchises of the Philadelphia, Bristol & Trenton Street Railway were purchased at public sale for the bondholders' committee. The committee then organized the Trenton, Bristol & Philadelphia Street Railway to take over the property, the members of the committee, with one or two exceptions, being the directors.

When the present company acquired the property it issued \$350,000 of notes to the committee, to be later refunded by bonds. On March 1, 1913, an issue of \$750,000 of first mortgage bonds having been authorized, \$406,000 of bonds were issued in temporary form to the committee to refund the above-mentioned notes, together with \$56,000 of accrued interest thereon to Jan. 1, 1913. The company further issued its note for \$4,200 to refund the interest on the \$350,000 of notes from Jan. 1, 1913, to March 1, 1913. Since that date no interest has been paid on the bonds or note, the earnings being required for improvements, and the interest has simply been carried on the company's books as a liability. It is proposed now to cancel this liability, exchange the \$406,000 of temporary bonds for permanent engraved bonds, and issue \$4,800 of additional bonds to refund the above-mentioned note and accrued interest to March 1, 1915. This will give the committee \$410,800 of first mortgage bonds for distribution among those who are holding the certificates of deposit.

The present stock is \$325,000 in \$50 shares. Nearly \$90,000 of earnings has been spent for new construction and permanent improvements. It is proposed to increase the authorized stock to \$500,000 and to issue \$85,800 of additional stock to capitalize a like amount expended for permanent improvements. This will give the committee \$410,800 of stock for distribution among the holders of certificates of deposit.

Since there are outstanding \$632,000 of certificates of deposit, the foregoing plan of distribution will entitle the holder of each \$1,000 face amount of certificates of deposit to receive \$650 in first mortgage bonds and \$650 in stock of the present company. The new securities will be exchanged for the certificates of deposit on this basis at the Union Trust Company of Maryland, Baltimore, Md., on and after Dec. 15. Funds for the payment of the first semi-annual interest coupon on the new bonds, dated

Sept. 1, are now on deposit with this trust company.

When the present company first took over the property and franchises of the Philadelphia, Bristol & Trenton Street Railway, extensive repairs were necessary to keep the line going, and as the company had little or no credit of its own it was necessary to use all of the earnings for upkeep, new construction and permanent improvements. During the last five years the roadbed has been largely rebuilt with new ties and rail, the overhead line overhauled and power house additions made. Practically every bridge has been rebuilt, either by the company alone or in conjunction with the public authorities. The break in the line at the Borough of Bristol requiring the operation of two separate lines was connected about two years ago, which has resulted in increased traffic and a decrease in operating expenses. The earnings for the five years are said to show gratifying results.

**Aberdeen (S. D.) Railroad.**—The Aberdeen Railway, which was sold at receiver's sale last August, is now succeeded by the Aberdeen Railroad. Of authorized issues of \$250,000 of stock and \$100,000 of bonds, \$100,000 and \$12,000 respectively have been put out.

**Barcelona Traction, Light & Power Company, Barcelona, Spain.**—Arrangements have been made in Toronto and London to exchange interim certificates representing 5 per cent ten-year notes for the interest coupons of Dec. 1, 1914, and June 1, 1915, on the 5 per cent first mortgage bonds of the Barcelona Traction, Light & Power Company. The discharge of the interest in this manner is in accordance with a resolution previously adopted by the bondholders, as noted in the *ELECTRIC RAILWAY JOURNAL* of July 17.

**Brooklyn (N. Y.) Rapid Transit Company.**—The New York Stock Exchange has listed \$20,000,000 of six-year 5 per cent secured gold notes of the Brooklyn Rapid Transit Company sold last October, as noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 9.

**Central Park, North & East River Railroad, New York, N. Y.**—Judge Dickinson, in the United States District Court at Philadelphia, on Dec. 1 dismissed the \$2,000,000 suit of Richard B. Kelly, a minority stockholder, against George W. Elkins and the estates of P. A. B. Widener and Thomas Dolan, for alleged neglect of duty as directors of the defunct Central Park, North & East River Railroad in New York City. The court held that recovery was barred by the statute of limitations. Permission was granted the plaintiff, however, to move within thirty days to amend his statement in an effort to bring it within the six-year statutory period.

**Chicago & Milwaukee Electric Railroad, Highwood, Ill.**—Federal Judges Landis and Geiger have ordered the Chicago & Milwaukee Electric Railroad sold at receivers' sale on April 1. This company, which has been in the hands of receivers for several years, was sold in 1912, but a resale was ordered on account of the suppression of bids.

**Detroit (Mich.) United Railway.**—The Detroit United Railway has received authority from the Michigan Railroad Commission to issue \$3,500,000 of 5 per cent collateral trust notes, dated Feb. 6, 1916, and maturing on May 5, 1918. A part of the proceeds will be used to retire \$2,000,000 of collateral trust two-year notes due on Feb. 5, 1916, and for betterments and extensions. The notes had been sold to William A. Read & Company, subject to the approval of the commission.

**Eastern Pennsylvania Railways, Pottsville, Pa.**—The Pottsville Union Traction Company, which is owned and operated by the Eastern Pennsylvania Railways, recently filed with the Pennsylvania Public Service Commission a certificate of notification regarding the proposed issuance of \$56,000 of second mortgage thirty-year 6 per cent gold bonds dated Feb. 1, 1913. The bonds will be delivered to the Eastern Pennsylvania Railways to reimburse that company for betterments and additions made by it to the lines of the subsidiary company.

**Eastern Texas Electric Company, Beaumont, Tex.**—The Eastern Texas Electric Company has called for payment on Jan. 1, at par and interest, its \$500,000 of three-year 6 per cent notes due on July 1, 1916. The holders of these notes have taken the larger part of a new issue of \$500,000

of three-year 6 per cent gold coupon notes dated Dec. 1, 1915, and due on Dec. 1, 1918, but callable as a whole at 100 and interest on thirty days' notice. Stone & Webster, Boston, Mass., are offering these new notes at 99 and interest, to yield 6.37 per cent.

**Empire United Railways, Inc., Syracuse, N. Y.**—A new committee representing holders of Rochester, Syracuse & Eastern Railroad first mortgage 5 per cent bonds has been formed to further the proposed reorganization plan described in the *ELECTRIC RAILWAY JOURNAL* of Dec. 11. The members are: W. L. Smith, A. N. Ellis, D. R. Cobb and E. F. Brown. The Central City Trust Company, Syracuse, and the Equitable Trust Company, New York, have been appointed depositaries for the bonds.

**Fort Wayne & Springfield Railway, Decatur, Ind.**—The property of the Fort Wayne & Springfield Railway was sold on Dec. 2 at receiver's sale to Charles H. Worden, trustee, Fort Wayne. Mr. Worden is vice-president of the First National Bank, Fort Wayne, and in his purchase represents his bank and other interests which held receiver's certificates of the company. For the present the road will continue operation on practically the same basis as when operated by the receiver, French Quinn, for the last three years. Just what will ultimately be done by the new owners has not yet been determined. The trustee has appointed Sam W. Greenland as general manager of the property, the road to be operated by Mr. Greenland in connection with his present office of general manager of the Fort Wayne & Northern Indiana Traction Company.

**Illinois Traction System, Peoria, Ill.**—It is reported that the board of directors of the Illinois Traction System has authorized the issuance of \$257,000 of 5 per cent debentures, due in 1925, the proceeds being required for discharging obligations of the company. The Bloomington, Decatur & Champaign Railroad has applied to the Illinois Public Utilities Commission for an order authorizing the issue of \$500,000 of its Series A preferred stock. The St. Louis, Springfield & Peoria Railroad has applied to the commission for an order authorizing the issue of \$1,000,000 of its Series A preferred stock. Both companies are controlled by the Illinois Traction System.

**Interborough Rapid Transit Company, New York, N. Y.**—Lee, Higginson & Company and N. W. Harris & Company, Boston, and Kissel, Kinnicutt & Company, New York, are offering \$25,000,000 of first and refunding mortgage 5 per cent gold bonds of the Interborough Rapid Transit Company, dated 1913 and due on Jan. 1, 1916. These 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. It is estimated that about \$32,000,000 of additional bonds will be issued to provide for the completion of the rapid transit construction authorized between the city and the company, and of these additional bonds \$5,000,000 are included in the \$25,000,000 now being offered.

**Kansas Electric Utilities Company, Lawrence, Kan.**—It is now announced that the Kansas Electric Utilities Company will take over in fee the properties owned and operated as the Parsons Railway & Light Company, the Emporia Railway & Light Company and the Lawrence Railway & Light Company, and these companies will be dissolved after the transfer of properties. A previous note referring to the amalgamation was published in the *ELECTRIC RAILWAY JOURNAL* of Nov. 27. The Kansas Electric Utilities Company has an authorized stock issue and an authorized bond issue of \$1,750,000. This company will be controlled by the Consolidated Utilities Company, a holding company being organized under the laws of Delaware, and it will be operated by the Albert Emanuel Company, Dayton, Ohio, Mr. Emanuel being the new president.

**Norton & Taunton Street Railway, Norton, Mass.**—Pursuant to a decree of the Supreme Court of Massachusetts for the County of Suffolk the property of the Norton & Taunton Street Railway will be offered for sale under foreclosure on Jan. 7, 1916, at Norton to satisfy a first mortgage, under which the American Trust Company is trustee for the bondholders. The upset price is fixed at \$75,000 and the purchase must be made subject to taxes, unpaid current liabilities of the receiver, etc.

**Petaluma & Santa Rosa Railway, Petaluma, Cal.**—The Petaluma & Santa Rosa Railway has applied to the California Railroad Commission for authority to issue additional 6 per cent coupons to be attached to second mortgage bonds payable on April 1 and Oct. 1, 1916, and April 1, 1917. There are 250 of these bonds outstanding, of the denomination of \$1,000 each.

**Philadelphia Company, Pittsburgh, Pa.**—The New York Stock Exchange has authorized the listing of an additional \$1,400,000 of common stock whenever issued and paid for in full. The total amount listed is now \$39,900,000. The stock in question has been sold for general purposes, since the notes for the conversion of which it was reserved have been paid.

**Public Service Corporation of New Jersey, Newark, N. J.**—The Bergen County Board of Freeholders having voted to take over the 7½-mile Bergen Turnpike between Hackensack and the Hudson County line, the Public Service Corporation of New Jersey has turned this over to the county for \$1, and will give a bond to assure the payment of \$1,000,000 of 5 per cent bonds issued in 1901 by the Bergen Turnpike Company. The Jersey City, Hoboken & Paterson Railway, now merged with the Public Service Corporation of New Jersey, owned a majority of the stock of the turnpike company and guaranteed its bond issue.

**San Francisco-Oakland Terminal Railways, Oakland, Cal.**—The July 2, 1915, coupons on the \$2,134,000 of "Oakland Traction Consolidated" general consolidated mortgage gold 5 per cent bonds of 1905, due in 1933, of the San Francisco-Oakland Terminal Railways may be now cashed from funds deposited with the Wells Fargo Nevada National Bank, San Francisco, and the National Park Bank, New York. Previous items with reference to deferred coupon payments of this company appeared in the ELECTRIC RAILWAY JOURNAL of Sept. 11, Oct. 23 and Oct. 30. Funds for the payment of all matured coupons are now on deposit with the agents of the company, with the exception of those on the \$3,177,000 of Oakland Traction Company general consolidated mortgage sinking fund 5 per cent bonds of 1907, due in 1935, and the \$1,587,000 of San Francisco, Oakland & San José Consolidated Railway general consolidated mortgage sinking fund 5 per cent bonds of 1908, due in 1938. The company will continue as heretofore the accumulation of daily deposits to pay interest.

**St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.**—The Cities Service Company has called for payment on Dec. 27 at par and accrued interest the outstanding \$718,000 of St. Joseph Railway, Light, Heat & Power Company 6 per cent sinking fund stock trust certificates. On Dec. 1, 1914, \$1,118,000 of these certificates were issued and sold, with the Guaranty Trust Company as trustee, a certain amount being retired each month by a sinking fund. The last of the certificates is due May 20, 1917.

**Syracuse & South Bay Electric Railroad, Syracuse, N. Y.**—The sale of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad is to take place on Jan. 21. These two companies were placed in the hands of Ernest Gonzenbach as receiver earlier in the year, as noted in the ELECTRIC RAILWAY JOURNAL of May 29.

**United Railroads of San Francisco, San Francisco, Cal.**—The United Railroads of San Francisco has applied to the California Railroad Commission for authority to issue \$1,800,000 of 6 per cent two-year promissory notes, and \$2,250,000 of 5 per cent gold bonds to mature in 1924 as security for the notes. The notes are to redeem the balance due on the Market Street Cable Railway bonds issued in 1882 for \$3,000,000, of which sum \$1,200,000 has been paid.

**Utah Securities Corporation, New York, N. Y.**—The Utah Securities Corporation has deposited with the Guaranty Trust Company, New York, \$3,000,000 to purchase for retirement as many of the company's ten-year 6 per cent notes as can be obtained with that sum. Tenders of the notes will be received up to Dec. 22. The deposited cash was secured by the sale of \$3,000,000 of 7 per cent first preferred stock of the Utah Power & Light Company to the Electric Bond & Share Company. The tenders in the case of the \$1,000,000 cash deposited for notes up to Dec. 2 ran as high as 93.5 and interest.

**Vera Cruz Electric Light, Power & Traction Company, Vera Cruz, Mex.**—The net earnings of the Vera Cruz Electric Light, Power & Traction Company for 1914, converted at the parity of exchange, leave a balance, after meeting all expenses and debenture interest, of £34,980. Owing to the heavy loss of £33,960 in exchange, however, the available balance of profit is reduced to £1,020, to which should be added the balance of £12,997 brought forward, making £14,017. This, owing to the present conditions in Mexico, the directors propose to carry forward. The directors report that, notwithstanding the continued political disturbance in Mexico, the property of the company has suffered no damage. The supply of power from the Puebla Tramway Light & Power Company commenced in January, 1915, and practically the whole of the company's power is now obtained from that company. The extension of the tramway system has now been completed and is working satisfactorily.

**Wellsville & Buffalo Railroad, Buffalo, N. Y.**—The Wellsville & Buffalo Railroad was incorporated on Dec. 10 with \$850,000 of capital stock. Its purpose is stated to be the operation of 85 miles of steam, gasoline or electric railroad from Wellsville to Buffalo. The directors include C. A. Finnegan, Theodore Hofeller and Abraham Weber, who recently purchased the abandoned line of the Buffalo & Susquehanna Railway between Buffalo & Wellsville. This purchase was mentioned in the ELECTRIC RAILWAY JOURNAL of Dec. 11 as being made from the Buffalo & Susquehanna "Railroad," but this company has been reorganized as the Buffalo & Susquehanna Railroad Corporation and is quite distinct from the Buffalo & Susquehanna "Railway," which was the property sold to the syndicate above mentioned.

**Winona Interurban Railway, Warsaw, Ind.**—A protective committee composed of J. D. Mortimer, S. J. Straus, M. W. Babb and S. C. Hubbell is asking for deposits of the \$750,000 of twenty-year first mortgage 5 per cent gold bonds of 1905 of the Goshen Division of the Winona Interurban Railway on or before Jan. 15 with the Central Trust Company of Illinois, Chicago, as depository under an agreement dated Dec. 4, 1915. A plan for the readjustment of the bonded indebtedness of this company, so as to insure the payment of interest on the present income, was described in detail in the ELECTRIC RAILWAY JOURNAL of Oct. 9. Pending negotiations under this plan, the Oct. 1 interest on the \$1,593,700 of bonds of the Peru Division was not paid.

**York (Pa.) Railways.**—The York Railways has issued a notice calling for the surrender of all dividend scrip on Jan. 30, 1916. Payment at par and accrued interest will be made by Brown Brothers & Company, New York. The company also has purchased, it is said, about all of its \$500,000 of one-year 6 per cent notes maturing on Feb. 1, 1916 (renewed from Feb. 1, 1915), and after that date will be practically without debt except as to first mortgage bonds. The company has increased the number of directors from seven to nine and elected John E. Zimmermann and Charles H. Bean to the newly-created places.

#### DIVIDENDS DECLARED

American Cities Company, New York, N. Y., 1½ per cent, preferred.

Boston & Worcester Electric Companies, Boston, Mass., \$1, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1½ per cent, preferred.

El Paso (Tex.) Electric Company, 3 per cent, preferred; quarterly, 2½ per cent, common.

Manila Electric Railroad & Light Corporation, Manila, P. I., quarterly, 1½ per cent.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred; one-half of 1 per cent, common.

New York State Railways, Rochester, N. Y., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Springfield Railway, Light & Power Company, Springfield, Mo., quarterly, 1 3/4 per cent, preferred.

Toronto (Ont.) Railway, quarterly, 2 per cent.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1 3/4 per cent, preferred; quarterly, 1 1/2 per cent, common.

Union Traction Company, Philadelphia, Pa., \$1.50.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1 1/4 per cent.

**ELECTRIC RAILWAY MONTHLY EARNINGS**

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

| Period         | Operating Revenues | Operating Expenses | Operating Income | Fixed Charges | Net Income |
|----------------|--------------------|--------------------|------------------|---------------|------------|
| 1m., Oct., '15 | \$167,521          | \$102,399          | \$65,122         | \$41,277      | \$23,845   |
| 1 " " '14      | 172,580            | 116,428            | 56,152           | 39,483        | 16,669     |
| 4 " " '15      | 713,318            | 447,046            | 266,272          | 162,740       | 103,532    |
| 4 " " '14      | 783,790            | 477,125            | 306,665          | 159,067       | 147,598    |

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

|                |          |          |          |          |          |
|----------------|----------|----------|----------|----------|----------|
| 1m., Oct., '15 | \$71,610 | \$35,587 | \$36,023 | \$17,613 | \$18,410 |
| 1 " " '14      | 69,422   | *30,533  | 38,889   | 17,370   | 21,519   |
| 12 " " '15     | 785,895  | *392,726 | 393,169  | 212,211  | 180,958  |
| 12 " " '14     | 778,690  | *374,603 | 404,087  | 208,884  | 195,203  |

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

|                |           |           |          |          |         |
|----------------|-----------|-----------|----------|----------|---------|
| 1m., Oct., '15 | \$98,155  | *\$62,535 | \$35,620 | \$30,240 | \$5,380 |
| 1 " " '14      | 88,261    | *58,067   | 30,194   | 28,655   | 1,539   |
| 12 " " '15     | 1,057,096 | *723,875  | 333,221  | 356,814  | †23,593 |
| 12 " " '14     | 1,108,598 | *698,404  | 410,194  | 333,135  | 77,059  |

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO.

|                |          |           |          |          |         |
|----------------|----------|-----------|----------|----------|---------|
| 1m., Oct., '15 | \$34,361 | *\$17,523 | \$16,838 | \$11,084 | \$5,754 |
| 1 " " '14      | 33,347   | *17,853   | 15,494   | 10,844   | 4,650   |
| 10 " " '15     | 341,456  | *185,541  | 155,915  | 109,842  | 46,073  |
| 10 " " '14     | 349,420  | *186,014  | 163,406  | 110,006  | 53,400  |

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.

|                |           |            |           |          |          |
|----------------|-----------|------------|-----------|----------|----------|
| 1m., Oct., '15 | \$272,152 | *\$155,914 | \$116,238 | \$40,189 | \$76,049 |
| 1 " " '14      | 262,685   | *146,703   | 115,982   | 38,934   | 77,048   |
| 12 " " '15     | 3,076,070 | *1,828,835 | 1,247,235 | 473,115  | 774,120  |
| 12 " " '14     | 3,069,757 | *1,918,374 | 1,151,383 | 473,642  | 677,741  |

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

|                |             |            |           |           |           |
|----------------|-------------|------------|-----------|-----------|-----------|
| 1m., Oct., '15 | \$1,245,866 | *\$650,441 | \$595,425 | \$373,097 | \$222,328 |
| 1 " " '14      | 1,184,387   | *640,140   | 544,247   | 354,160   | 190,087   |
| 12 " " '15     | 14,173,088  | *7,532,353 | 6,640,735 | 4,385,885 | 2,254,850 |
| 12 " " '14     | 14,097,324  | *7,708,682 | 6,388,642 | 4,149,614 | 2,239,028 |

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

|                |           |            |           |          |          |
|----------------|-----------|------------|-----------|----------|----------|
| 1m., Oct., '15 | \$226,793 | *\$130,373 | \$96,420  | \$65,507 | \$30,913 |
| 1 " " '14      | 214,808   | *124,150   | 90,658    | 62,050   | 28,608   |
| 12 " " '15     | 2,598,663 | *1,482,210 | 1,116,453 | 785,452  | 331,001  |
| 12 " " '14     | 2,514,508 | *1,437,982 | 1,076,526 | 761,103  | 315,423  |

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

|                |           |            |           |          |          |
|----------------|-----------|------------|-----------|----------|----------|
| 1m., Oct., '15 | \$222,456 | *\$125,272 | \$97,184  | \$63,051 | \$34,133 |
| 1 " " '14      | 216,801   | *130,395   | 86,406    | 62,175   | 24,231   |
| 12 " " '15     | 2,430,418 | *1,436,389 | 994,029   | 760,804  | 233,225  |
| 12 " " '14     | 2,686,595 | *1,673,694 | 1,012,901 | 868,393  | 344,508  |

GRAND RAPIDS (MICH.) RAILWAY

|                |           |           |          |          |          |
|----------------|-----------|-----------|----------|----------|----------|
| 1m., Oct., '15 | \$97,125  | *\$71,592 | \$25,533 | \$14,061 | \$11,472 |
| 1 " " '14      | 102,963   | *70,443   | 32,520   | 13,990   | 18,530   |
| 12 " " '15     | 1,189,541 | *826,205  | 363,336  | 164,352  | 199,164  |
| 12 " " '14     | 1,286,295 | *834,409  | 451,886  | 160,123  | 291,763  |

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

|                |          |           |          |          |         |
|----------------|----------|-----------|----------|----------|---------|
| 1m., Oct., '15 | \$63,932 | *\$40,069 | \$23,863 | \$15,951 | \$7,912 |
| 1 " " '14      | 57,309   | *37,506   | 19,803   | 15,569   | 4,234   |
| 12 " " '15     | 722,203  | *469,777  | 252,426  | 189,242  | 63,184  |
| 12 " " '14     | 679,626  | *463,852  | 215,774  | 185,789  | 29,985  |

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

|                |           |            |          |          |          |
|----------------|-----------|------------|----------|----------|----------|
| 1m., Oct., '15 | \$189,636 | *\$121,088 | \$68,548 | \$43,141 | \$25,407 |
| 1 " " '14      | 191,814   | *108,204   | 83,610   | 41,921   | 41,689   |
| 12 " " '15     | 2,135,656 | *1,299,749 | 835,907  | 497,717  | 338,190  |
| 12 " " '14     | 2,246,484 | *1,365,687 | 880,797  | 495,560  | 385,237  |

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

|                |           |           |           |          |          |
|----------------|-----------|-----------|-----------|----------|----------|
| 1m., Oct., '15 | \$339,599 | \$206,249 | \$133,350 | \$54,358 | \$78,992 |
| 1 " " '14      | 304,413   | 190,988   | 113,425   | 50,858   | 62,567   |
| 10 " " '15     | 3,168,960 | 1,954,982 | 1,213,978 | 521,028  | 692,950  |
| 10 " " '14     | 3,032,972 | 1,854,005 | 1,178,967 | 506,104  | 672,863  |

PORTLAND (ME.) RAILROAD

|                |           |           |          |          |          |
|----------------|-----------|-----------|----------|----------|----------|
| 1m., Oct., '15 | \$92,502  | *\$56,739 | \$35,763 | \$21,115 | \$14,648 |
| 1 " " '14      | 87,095    | *53,623   | 33,472   | 19,193   | 14,279   |
| 12 " " '15     | 1,055,527 | *657,972  | 397,555  | 263,118  | 134,437  |
| 12 " " '14     | 1,042,698 | *643,206  | 399,492  | 254,031  | 145,461  |

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

|                |           |            |           |           |          |
|----------------|-----------|------------|-----------|-----------|----------|
| 1m., Oct., '15 | \$453,225 | *\$257,246 | \$195,979 | \$182,766 | \$13,213 |
| 1 " " '14      | 510,812   | *257,706   | 253,106   | 183,914   | 69,192   |
| 12 " " '15     | 5,582,361 | *3,080,788 | 2,501,573 | 2,209,207 | 292,366  |
| 12 " " '14     | 6,447,772 | *3,298,883 | 3,148,889 | 2,158,547 | 990,342  |

\*Includes taxes. †Deficit.

**Traffic and Transportation**

**COMPANY LOSES TRENTON FARE CASE**

**Commission Disapproves Withdrawal of Six-for-a-Quarter Tickets—Appeal to Supreme Court**

The Board of Public Utility Commissioners of New Jersey on Dec. 14 handed down its decision in the case in which the city of Trenton sought to prevent the Trenton & Mercer County Traction Corporation from withdrawing from sale its six-for-a-quarter tickets. The board holds "that the proposed withdrawal of the sale of six tickets for 25 cents by the Trenton & Mercer County Traction Corporation, and the increase, change or alteration in charge, rate or classification which would result therefrom is not just and reasonable and disapproves the same."

Under date of Aug. 13, 1915, the company notified the board that it proposed to discontinue the sale of the tickets and charge a 5-cent fare, and in a later communication advised the board that the change would become effective on Aug. 20. On Aug. 17 the board entered an order suspending the increase. The company then appealed to the United States District Court for an injunction to restrain the commission and the city from interfering with the elimination of the six-for-a-quarter tickets. Meanwhile the commission on account of the court action continued its hearing without taking testimony. Subsequently the court recognized the jurisdiction of the commission in the case. The commission then proceeded with the hearings. These hearings were reviewed briefly in the ELECTRIC RAILWAY JOURNAL of Oct. 30, page 931, and Nov. 20, page 1058. The company expects to take the case to the Supreme Court for review.

**CONTENTION THAT ILLINOIS UTILITIES ACT IS UNCONSTITUTIONAL**

In a cross-bill filed in the Circuit Court in the suit commenced by the city of Chicago questioning the jurisdiction of the Illinois Public Utilities Commission, the attorneys for the surface railways in Chicago contend that the commission act is unconstitutional. The filing of this cross-bill puts the railway companies and the city in the position of complainants and the Public Utilities Commission as defendants. The complainants in the cross-bill include the Chicago City Railway, the Chicago Railways, the Calumet & South Chicago Street Railway and the Southern Street Railway. The bill sets forth that the provision of the utilities act giving the commission control over the street railways of Chicago, violates the section of the State constitution, which confers this jurisdiction upon cities. It also declares that the legislative, executive and judicial powers conferred upon the commission are contrary to the constitution. A question is also raised as to the validity of the provision which constitutes the Circuit Court of Sangamon County a court of appellate jurisdiction. The cross-bill states further that the enforcement of the commission's service order would prevent the companies from meeting traffic demands during the rush hours and would cause intolerable delay, annoyance and inconvenience to the traveling public. The bill finally asks the court to decree that the order of the commission is null and void.

The salient features of the order issued by the commission fixing service standards in Chicago were referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 9, page 775.

**WESTERN RAILROADS GRANTED RATE INCREASE**

Substantial increases in the interstate passenger fares for the railroads operating in the western territory were granted by the Interstate Commerce Commission on Dec. 11, 1915. While this advance in rates does not entirely meet the formal application filed by the carriers, the increases range from 0.25 cent to 1 cent per mile. The railroads affected by this order were instructed to file new passenger tariffs on Jan. 15, 1916. The findings of the commission were as follows:

1. In the States of Illinois, Wisconsin, Michigan, Minn.

sota, Iowa, Nebraska, Missouri, north of the Missouri, and in Kansas north of the main line of the Union Pacific, a basis of 2.4 cents a mile for interstate fares is justified.

2. In Missouri south of the river and in Kansas south of the Union Pacific, a basis of 2.6 cents a mile is justified.

3. Increases in mileage prices of one-fourth of a cent a mile are allowed in the territory north of the Missouri River and the Union Pacific, and one-half of a cent south of the river and the railroad.

4. Proposed increases from Illinois, Michigan, Iowa, Minnesota, Wisconsin, Nebraska, Missouri and Kansas to points east are allowed.

5. Increases allowed on fares to far west from points in western territory.

**OPERATING STATISTICS IN SAN FRANCISCO AND LOS ANGELES**

A detailed comparison of street car traffic in San Francisco and in Los Angeles has recently been made by the California Railroad Commission. The figures for San Francisco railways include the United Railroads, Municipal Railway and the California Street Cable Railway, but those for Los Angeles do not include the Pacific Electric Railway, as that road handles interurban business almost exclusively and the comparison is intended to include local traffic only. The operating statistics for the two cities for the year ended June 30, 1915, are as follows:

|                                                | San Francisco | Los Angeles |
|------------------------------------------------|---------------|-------------|
| Passenger car-miles .....                      | 30,587,629    | 29,261,200  |
| Passenger car-hours .....                      | 3,591,611     | 3,128,042   |
| Regular fare passengers .....                  | 201,574,155   | 125,939,865 |
| Revenue transfer passengers .....              | 1,517,360     | .....       |
| Total revenue passengers .....                 | 203,089,515   | 125,939,865 |
| Free transfer passengers .....                 | 79,234,452    | 42,965,583  |
| Total all passengers .....                     | 282,323,967   | 168,905,448 |
| Passenger revenue .....                        | \$10,044,930  | \$6,203,161 |
| Average fare, revenue passengers .....         | \$0.04946     | \$0.04925   |
| Average fare, all passengers .....             | \$0.03558     | \$0.03672   |
| Revenue from transportation per car-mile ..... | \$0.32839     | \$0.21195   |
| Revenue from transportation per car-hour ..... | \$2.79677     | \$1.98308   |

**One-Man Car in North Ballard.**—The Loyal Railway, operating a 2-mile street railway in North Ballard, Wash., has been authorized by the Public Service Commission to operate a one-man car.

**Application to Charge 2 Cents a Mile.**—After a hearing in Pittsburg, the Public Utilities Commission in Kansas gave the Joplin & Pittsburg Railway ten days in which to file an inventory of its physical property for use in determining rates. The company has asked permission to charge 2 cents a mile.

**Proceed Signal by Whistle.**—A new detail of the safety-first campaign of the Dallas (Tex.) Consolidated Electric Street Railway is the adoption of whistles for signals to be used by conductors when preceding cars across railroad crossings. The motorman has been signalled in the past by the conductor waving his arm.

**Traffic Circulars in New York.**—The Fifth Avenue Coach Company, New York, has published a guide to Central Park in New York. The important features of the park are described and many of them are illustrated. The booklet is being sold to the public for 10 cents and the net proceeds, so the company announces, will be turned over to the Public Schools Athletic League of New York City.

**Skip-Stop Agitation in Richmond.**—Many patrons of the Virginia Railway & Power Company, Richmond, Va., have written to the company recommending that the skip stop be tried in Richmond. In its publication, *Public Service News*, the company says that the adoption of the skip stop on Richmond lines serving residential sections would save passengers from five to ten minutes in either direction.

**Ontario Board's Order Set Aside.**—The Toronto & York Radial Railway's project of crossing the sidewalk on the west side of Yonge Street at Farnham Avenue, Toronto, Ont., so as to provide a southern terminal at this point has been decided in favor of the city of Toronto by the decision of the First Divisional Court delivered on Dec. 8, in which the Ontario Railway Board's order authorizing the deviation is set aside.

**Electric Railways Reduce Fares for Holidays.**—In order to stimulate holiday travel the Texas Traction Company, the

Southern Traction Company and the North Texas Traction Company have put into effect a passenger tariff providing round-trip rates to the chief shopping centers of slightly less than one and one-third fare. This is the first time the electric railways have met the customary reduction of the steam roads during such rush seasons.

**Commission Refuses Pittsburgh Transfer Request.**—The renewed request of the Twenty-seventh Ward Progressive Club, Pittsburgh, Pa., that the Pittsburgh Railways be compelled to extend transfer privileges has been refused by the Public Service Commission of Pennsylvania on the ground that the transfers would do no more than save a walk of one or two city blocks, whereas granting the privilege asked might seriously congest traffic.

**Auto Feeder in Hot Springs.**—The Hot Springs (Ark.) Street Railway has established permanent auto-bus transportation between the city and the Golf and Country Club. Hot Springs has, perhaps, the finest full course golf links south of the Mason and Dixon line, and the increased patronage made it necessary to provide some permanent and satisfactory form of transportation. In a year or so the street railway will probably be extended to the links.

**Chicago "Fresh-Air" Cars Off During Winter.**—During the extremely cold weather of the winter months the "fresh-air" cars operated by the Chicago surface and elevated lines will be discontinued at the request of Commissioner of Health John Dill Robertson. The commissioner stated that the "fresh-air" cars had been a success; that they had stirred up public opinion in favor of fresh air, and that they had encouraged citizens to sleep out of doors. It is planned to restore the "fresh-air" car service next spring.

**Municipal Railway-Bus Agreement Unsatisfactory.**—According to reports the arrangement entered into by F. M. Peterson with the city of Seattle, Wash., for the operation of a motor bus 1.3 miles from the north terminus of Division "A" of the Municipal Railway to Ballard, a suburb of Seattle, has not proved a success. Mr. Peterson alleges that for the short period of operation from Nov. 4, his receipts have not exceeded \$5 a day. The contract allowed the operator of the motor bus 3 cents on every transfer from the railway. The provisions of the contract were referred to at length in the *ELECTRIC RAILWAY JOURNAL* of Oct. 23, page 889. The agreement when drawn was regarded as very favorable to the bus operator.

**Jitney Insurance Prospects.**—The jitney insurance feature continues to be an important one. The hesitancy of the stock companies and the lack of State laws giving interinsurance exchanges the privilege of doing business, combine to prevent jitneys getting insurance in many cities. Ordinarily, too, the stock company rates are much beyond the reach of the jitney owners. The rates of the stock company which is said to be writing the largest number of jitneys are \$35 to \$85 above those of the interinsurance exchanges. The National Indemnity Exchange at Kansas City is accumulating much valuable experience in the operation of its contracts which, when it reaches a point justifying announcement, will probably shed much light on the jitney business and its prospects. The exchange insures jitneys in five States, covering fire and theft, passenger and public liability, and property damage.

**Fare Complaint Settled.**—The complaint against a proposed increase of fares by the Syracuse & Suburban Railroad, Syracuse, N. Y., has been settled. The company has agreed to provide in its new tariffs a coupon book, non-transferable, and containing eighty-three 5-cent coupons, to be sold for \$2.50. It has also agreed that its \$5 coupon book can be used by the purchaser or any member of his or her family. In addition the road has promised to decrease, if possible, the running time between the terminals of the main line, to install an automatic signal system to be approved by the Public Service Commission, and to stone ballast a portion of the roadbed, all of these changes to be effected during the coming spring and summer and to be completed by Jan. 1, 1917. The company has further agreed to rebuild or replace car No. 18 during 1916 and to provide another new car in 1917, and to widen the track centers on East Fayette Street, Syracuse, between Beech Street and Syracuse city line junction when that portion of East Fayette Street is being repaved.

## Personal Mention

Mr. Safford K. Colby, formerly one of the vice-presidents of Allen & Peck, Inc., has been appointed assistant general sales manager of the Aluminum Company of America. Mr. Colby was previously associated with this company and has recently returned to it after a period of about ten years, during which time he was engaged in other capacities.

Mr. E. B. Katté, chief engineer electric traction with the New York Central & Hudson River Railroad, was announced as the speaker before the Worcester Polytechnic Institute branch of the American Institute of Electrical Engineers on Dec. 17. The subject upon which Mr. Katté spoke was "Electrification of the Grand Central Terminal," illustrated by lantern slides.

Mr. Sam W. Greenland, general manager of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been appointed general manager of the Fort Wayne & Springfield Railway, Decatur, Ind., by Mr. Charles H. Worden, Fort Wayne, trustee of the latter railway, which was sold on Dec. 2 at receiver's sale to Mr. Worden. The road will be operated by Mr. Greenland in connection with his present position with the Fort Wayne & Northern Indiana Traction Company.

Mr. E. C. Ryder, who has been a director of the Bangor Railway & Electric Company, Bangor, Me., for several years and its general counsel, has been elected president of the company. Mr. Ryder is a well-known Maine attorney. He is general counsel in that State for the Canadian Pacific Railroad and the Eastern Trust & Banking Company. He has been closely associated with the growth and development of the Bangor Railway & Electric Company and its subsidiaries for nearly ten years. Mr. Ryder was born in Readfield, Me., in 1854, attended Colby College and was admitted to the practice of law in Maine in 1882. He has lived in Bangor since 1894. Mr. Ryder has served in the State Legislature and was elected to the House and the Senate. He served as solicitor for the city of Bangor for two terms. Mr. Ryder is a member of the law firm of Ryder & Simpson. He proposes to continue his law practice. Mr. Ryder succeeds the late John R. Graham as president of the company at Bangor.

Mr. Harry C. Kendall has resigned as traffic engineer with the Portland Railway, Light & Power Company, Portland, Ore., as noted briefly in the *ELECTRIC RAILWAY JOURNAL* of Dec. 4, to become efficiency and traffic engineer with the Denver (Col.) Tramway, a new position created by General Manager F. W. Hild, formerly of the Portland Company. Mr. Kendall was graduated in electrical engineering from the University of Missouri in 1904 and from the Massachusetts Institute of Technology in 1905. He was in the employ of the Westinghouse Electric & Manufacturing Company from 1905 to 1909, first as an engineering apprentice and later in the railway engineering department. For the following two years Mr. Kendall was instructor in electric railway engineering at the University of Illinois. Mr. Kendall was next engaged in making special engineering investigations for industrial concerns and for the Illinois Traction System. In 1912 he resigned his position with the Illinois Traction System to make a traffic survey and work out rerouting plans for the Portland Railway, Light & Power Company.

Mr. J. Kappeyne, who has been appointed engineer to the Public Utilities Commission of the District of Columbia, was born in Amsterdam, Holland, in 1882, and was graduated as mechanical and electrical engineer from the Polytechnical School of Zurich, Switzerland. Immediately after completing his education, Mr. Kappeyne came to the United States and was naturalized as soon as the requirements of the law would permit. Before becoming connected with the Public Utilities Commission of the District of Columbia he was engaged with the New York State Public Service Commission for the First District, on the valuation of the street railways of greater New York. For the last year he has been connected with the valuation of the utilities in the District of Columbia ordered by Congress. Previous to this Mr. Kappeyne was employed on the design and installation of the equipment of the subaqueous tunnels of the Hudson

& Manhattan Railroad between New York and New Jersey and of the subways now in course of construction in New York.

Mr. F. T. Loftus, auditor of the Indianapolis & Cincinnati Traction Company, was elected president of the Central Electric Railway Accountants' Association for the year 1916, at the recent meeting in Detroit. Mr. Loftus has been in the electric railway field since June, 1907. He was born at Anderson, Ind., in November, 1881, and attended the schools there until his family moved to Chicago, in 1898. After reaching Chicago, Mr. Loftus found it necessary to secure employment and attended night school, taking up a general business course but specializing in accounting with that in view as a future business. From 1899 to 1907 he held positions in the offices of photo-engraving, real estate and retail



F. T. LOFTUS

dry goods companies, but being impressed with the future which promised for the electric railway business, he secured employment as passenger and freight agent with the Indianapolis & Cincinnati Traction Company at Shelbyville, Ind., on June 1, 1907. In September, 1908, he was promoted to cashier of the company with headquarters at Rushville, Ind. He held this position until July, 1909, at which time he became general bookkeeper. On Aug. 1, 1910, he was appointed acting auditor of the company, continuing as bookkeeper until a year later. He was appointed auditor in October, 1911, and has held that position since. Mr. Loftus has been a member of the Central Electric Railway Accountants' Association since 1911. He has served on various committees of the association, as secretary for 1913 and 1914 and as first vice-president during 1915.

Mr. Edward M. Graham, son of the late John R. Graham, Bangor, Me., has been elected vice-president and general manager of the Bangor Railway & Electric Company, the Bangor Power Company and the Orono Water Company and general manager of the Bar Harbor & Union River Power Company, succeeding his father in the active management of these properties, in which E. W. Clark & Company, Philadelphia, are interested. Mr. Graham is only twenty-six years old, and is one of the youngest general managers in charge of so extensive a property. Since his father's death last August, Mr. Edward M. Graham has been in active charge of the Bangor Railway & Electric



E. M. GRAHAM

Company properties, having been fitted for the position through an experience of several years under his father. He began his career with the Bay State Street Railway, Boston, which he served in various capacities. At the age of twenty-two he was made superintendent of the Portland & Brunswick Street Railway and after that was made assistant to the general manager of both the Lewiston, Augusta & Waterville Railway and the Cumberland County Power & Light Company, these being among the largest public service corporations in Maine. He went to Bangor in 1913 as assistant to his father, the president of the properties, and has been with the companies there since. The companies of which Mr. Graham is now vice-president and general manager provide sixteen municipalities with light and power, six with water and nine with street railway service, and own 65 miles of track.

Mr. Delos Emmons Parsons has been appointed general manager of the East St. Louis & Suburban Railway, East St. Louis, Ill., a new office, the duties in connection with which have in the past been attended to by the vice-presidents and the general superintendent. Mr. Parsons will assume his office with the company on Jan. 1. His appointment is in no sense a substitute for any present officer of the company, but was made because the president of both the East St. Louis & Suburban Company and the president of the East St. Louis & Suburban Railway and the other properties at East St. Louis under the management of the E. W. Clark & Company Management Corporation decided that the best interest of both the public and the stockholders would be enhanced by the appointment of a general manager who would devote his entire time to the supervision of the heads of the various departments and of the work of each and make a constant study of means and methods of improving service to the public and of promoting co-operative efficiency among officers and employees. Mr. Parsons was born at Huntington, W. Va., on Oct. 29, 1882. In 1903 he received the degree of bachelor of science in mechanical engineering at West Virginia University. In 1904 he entered the technical two-year apprenticeship course in the works of the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa. At the end of the two years he accepted a position in the sales department at the works of the company, and in 1906 he was promoted to the position of head of the export department at the company's works. In 1908 he represented the sales department of the Westinghouse Company in its branch office at Fairmont, W. Va., handling the sale of the company's product to the coal mining companies in that district. In 1909 he joined the sales force in the railway and lighting department of the company.



D. E. PARSONS

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#### OBITUARY

**William Andrew Conner** died suddenly on Dec. 6. Mr. Conner was born in Baltimore on Sept. 12, 1859. He began his business career in 1876, in Pittsburgh, in the oil refining business. In 1885 he took charge of the first plant built by the Standard Underground Cable Company in Pittsburgh, and from then to the time of his death he was the head of the manufacturing business of that company. He was a director of the company for ten years, and had been first vice-president since 1909.

**George W. Linch**, receiver of the Second Avenue Railroad, New York, N. Y., died on Dec. 15. Mr. Linch was born on Nov. 27, 1847, in New York. After graduating from public school, he became a clerk in a New York wholesale house, of which he later became manager. Upon the retirement of his employer from business, Mr. Linch entered the furniture business, in which he continued until 1872. In that year the Christopher & Tenth Street Railroad, New York, was completed and Mr. Linch became general manager of the company and later secretary and treasurer, which position he held at the time of his death. About 1889 Mr. Linch became the general manager of the Dry Dock, East Broadway & Battery Railroad, New York, and remained as its general manager until about 1900, when the control of the company passed to the Metropolitan Street Railway. Mr. Linch then built and operated the Morton Stables in New York City. After this business had been sold Mr. Linch became general superintendent of the Varrick Realty Company. He was subsequently elected vice-president of the United States Casualty Company. On Aug. 1, 1908, Mr. Linch resigned from the Casualty Company to become general manager of the Central Park, North & East River Railroad, which position he held until he was appointed receiver of the company by the Supreme Court. He was acting as receiver of this company at the time of his death. On Sept. 19, 1908, he was appointed receiver of the Second Avenue Railroad.

## Construction News

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

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

#### RECENT INCORPORATIONS

**Pocatello Traction & Interurban Company, Pocatello, Idaho.**—Incorporated in Idaho to construct a line in Pocatello. Capital stock, \$100,000. Officers: Richard Douglas, president; John Fraser, vice-president and Clark Gibson, secretary and treasurer. [Dec. 11, '15.]

**\*Wellsville & Buffalo Railroad, Buffalo, N. Y.**—Incorporated in New York to operate steam, gasoline or electric railroad from Wellsville to Buffalo. Capital stock, \$850,000. The directors include C. A. Finnegan, Theodore Hofeller and Abraham Weber, who recently purchased the abandoned line of the Buffalo & Susquehanna Railroad between Buffalo and Wellsville, as noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 2.

**\*East Tennessee Railroad, Benton, Tenn.**—Incorporated in Tennessee with a capital stock of \$20,000. Incorporators: F. W. Hoover, Richard Stiles, Henry Crumbliss, Jr., George D. Lancaster and J. A. Longley.

#### FRANCHISES

**Los Angeles, Cal.**—The Pacific Electric Railway has asked the Council for permission to abandon a part of its elevated railway franchise from the rear of the Main Street station eastward to San Pedro Street, so that it may comply with the recent order of the Board of Public Utilities to improve its terminals. The request was referred to the Board of Public Utilities for investigation and report.

**San Diego, Cal.**—The San Diego Electric Railway has asked the Council for permission to abandon that portion of its line on University Boulevard from University Avenue to El Cajon Avenue as soon as the new line up Park Boulevard from University Avenue to El Cajon Avenue is in operation.

**Buffalo, N. Y.**—The Council has denied the application of the International Railway for a franchise to lay tracks and operate cars in Washington Street between Perry and Ohio Streets so as to loop cars around the new Lackawanna Railroad passenger terminal via Main, Perry, Washington and Ohio Streets. The company has modified this application and now seeks to operate cars through Illinois Street from Perry to Ohio Streets. The Council is favorable to this project and a hearing on this application will be held on Dec. 23. The company's application for a franchise on Ohio Street from Washington to Main Street to connect directly with the new Lackawanna Railroad terminal has been approved.

**Dayton, Ohio.**—The Dayton & Troy Electric Railway has received a twenty-year extension of its franchise in Dayton. The company agrees to build an extension on Clark Avenue, to improve its local service, to pave its freight yard and to pave within the rails and 18 in. outside when any street is ordered paved.

**East Liverpool, Ohio.**—The East Liverpool Traction & Light Company has received from the Council a ten-year extension of its franchise. The franchise, which was to have expired in 1930, now extends to 1940.

**Dallas, Tex.**—The Northern Texas Traction Company has accepted the franchise granted by the Council to construct an extension on Jefferson Street.

#### TRACK AND ROADWAY

**Phoenix (Ariz.) Railway.**—It is reported that this company will double track its line on West Washington Street to the Capitol.

**Fresno (Cal.) Interurban Railroad.**—A report from this company states that during 1916 it expects to build 18½ miles of new electric line between Fresno and Clovis and Fresno and Centerville.

**Pacific Electric Railway, Los Angeles, Cal.**—Plans for elevated tracks and terminal improvements for this company have been completed and the scheme has been ap-

proved by the Board of Public Utilities which had previously ordered the company to execute whatever work necessary to relieve congested interurban traffic on or before July 1, 1916. Further details regarding the plan are published on page 1231 of this issue.

**Municipal Railways of San Francisco, San Francisco, Cal.**—Now that the early commencement of construction of the Church Street branch of the Municipal Railway has been assured, the executive committee of the Mission Promotion Association is devoting its efforts to securing extensions to the rest of the Municipal Railway system. Property owners and improvement clubs in the various sections of the city have been submitting plans for proposed extensions. As yet, however, the association has taken no action upon the proposals, as its intention is to consider each of the applications individually and then to prepare a report which will be submitted to the Board of Supervisors in which the association will request extensions in various parts of the city.

**Tidewater Southern Railway, Stockton, Cal.**—Grading has been begun by A. G. Chatan on this company's extension from Modesto to Turlock.

**Miami (Fla.) Traction Company.**—Operation has been begun on this company's line in Miami. The cars are operated from Twelfth Street and Avenue O, Riverside Heights, to Twelfth Street and Avenue C. Track has been laid on Avenue C from Twelfth Street to Waddell Street, 1 mile, and this will soon be placed in operation. The entire line is 3½ miles long.

**Alton, Granite & St. Louis Traction Company, Alton, Ill.**—L. C. Haynes, president of this company, has answered the communication from the Mayor of Alton, in which the company was asked to build an electric line from Alton to the State Hospital. President Haynes says the line will be built if Alton and Wood River Townships guarantee to adjust all possible claims for damages arising from the building of the line and make arrangements for such adjustments before the line is built.

**Illinois Traction System, Peoria, Ill.**—It is reported that this company plans to construct a line between Jefferson City and Columbia.

**Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.**—A movement is under way among residents of the south and southwest sections of Gary to urge this company to build a 4-mile loop through that portion of the city. The proposed route would extend south on St. Joseph Street to Twenty-first Avenue, east to Virginia Avenue, thence north to connect with the company's line just north of Fifth Avenue.

**Iowa Railway & Light Company, Cedar Rapids, Ia.**—The electric light plant at Zearing, owned by Belden & Son, has been purchased by this company. Next summer the system will be connected with the high-tension line being erected from Marshalltown to Colo and Ames.

**Tri-City Railway Company, Davenport, Iowa.**—This company is being urged to build an extension in the extreme southwestern part of the city, the line to be an extension of either the Third Avenue or the Fourth Avenue track.

**Manhattan City & Interurban Railway, Manhattan City, Kan.**—This company expects to build 1 mile of city line during 1916.

**Kentucky Traction & Terminal Company, Lexington, Ky.**—In order to obviate interruptions to service from storms or accidents, the Kentucky Traction & Terminal Company is completing arrangements for the construction of new high tension lines to connect all of the present termini by loop systems. The new lines will include power circuit construction from Georgetown to Frankfort, about 25 miles in an air line, and connecting up other high tension lines already completed. At present one line of power wires runs to Versailles and Frankfort and another to Georgetown. It is planned to manage the new construction so that in the event of a break at any point service can be continued by bringing in the power from another direction. There is now a loop between Georgetown and Paris. Rights-of-way have been secured for practically the entire construction which, it is believed, will be sufficient to prevent delays encountered heretofore on account of local storms.

**Bar Harbor & Union River Power Company, Bangor, Me.**—This company contemplates the construction of an electric railway from Bluehill Falls to Brookline and Sedgwick, 14 miles. C. M. Tolman, chief engineer.

**Boston (Mass.) Elevated Railway.**—Plans for a change of location of a portion of the proposed extension of the elevated road to Everett have been filed with the Public Service Commission by this company. The change affects the route between Mystic Street and Bernard Avenue, Everett. It is proposed to extend the elevated structure over the Mystic River and reach the grade of the street opposite Langdon Street and any further extension of the line will be through a subway.

**Springfield (Mass.) Street Railway.**—This company will change its present system to the three-wire plan to eliminate electrolysis. This is in accordance with the recommendations of the Bureau of Standards at Washington. The work of making the changes will be begun immediately.

**\*Detroit, Mich.**—Having obtained the necessary franchises shortly before the November annexation election, Robert Oakman, Detroit, is now preparing to build an electric line which will take care of the territory between Hamilton Boulevard and Grand River Avenue and between the old city limits and Highland Park. Mr. Oakman has announced that before the end of next summer he would complete a line from Oakman Boulevard south to the corner of Twelfth Street and Elmhurst Avenue. Plans are being made to extend this line south to the city limits to connect with the Trumbull, Fourteenth and Grand Belt lines when these are extended.

**Minnesota-Northwestern Electric Railway, Thief River Falls, Minn.**—A report from this company states that it expects to build 20 miles of new line during 1916.

**St. Louis & Jennings Railway, St. Louis, Mo.**—It is stated that this company's extension south on Helen Avenue from Florissant to Melrose Avenues, Edgewood, will be completed in about three weeks.

**\*Fort Benton, Mont.**—The Commercial Club of Fort Benton has appointed a committee consisting of L. D. Sharpe, C. O. Vowell, C. W. Hudson and D. G. Browne, to proceed to make investigations and secure data on the construction of a trolley line to the depot, a distance of more than a mile.

**Brooklyn & Jamaica Bay Railway, Brooklyn, N. Y.**—The Public Service Commission for the First District of New York has denied the application of the Brooklyn & Jamaica Bay Railway for a certificate of public convenience and necessity for the construction and operation of a proposed trolley line in Brooklyn, extending from a point at about the intersection of Montauk and Liberty Avenues and in a general southerly direction over numerous streets and avenues to a point where Montauk Avenue would end if extended to Jamaica Bay.

**Southern Power Company, Charlotte, N. C.**—It is reported that this company plans to construct an electric railway from Greensboro to Reidsville and Spray, about 30 miles. W. S. Lee, vice-president and chief engineer.

**Durham (N. C.) Traction Company.**—During 1916 this company expects to build 2.6 miles of single track in Durham.

**Pictou County Electric Company, Ltd., Sellerton, N. S.**—It is reported that this company will not build its proposed extension to Parkdale until next spring.

**Northern Ohio Traction & Light Company, Akron, Ohio.**—This company expects to build 0.7 mile of city extension. The company also proposes to construct 9.4 miles of double track between Akron and Cleveland for cut-offs.

**Dayton & St. Mary's Traction Company, Covington, Ohio.**—Promoters of the Dayton & St. Mary's Traction Company held a meeting on Dec. 10 and appointed the following committee to consider plans of financing the company: H. S. Shelton, W. J. Focke, I. G. Kumler, C. E. Jones, O. B. Brown and J. W. Downer. Right-of-way in Miami County has been donated and much in Shelby. The plan provides for the purchase or lease of the 10 miles of Western Ohio Railroad tracks between St. Mary's and Minster, use of the 6-mile line between Minster and Fort Loramie and construction of 16.6 miles from Fort Loramie on. [Aug. 7, '15.]

**Mount Vernon (Ohio) Railway.**—A report from the company states that it expects to build 2 miles of city line during 1916.

**Henryetta, Oklahoma & Western Railway, Henryetta, Okla.**—The contract for grading this company's line has been awarded to Ally Brothers. The road is being built from Henryetta to Kusa, via Dewar, with a branch to Colton and Pleasant Valley and from Henryetta to Creek Mines, a total of about 10 miles. One bridge and one viaduct will be built. The contract for track laying has not yet been awarded. W. T. Croslen, Oklahoma City, president. [Nov. 13, '15.]

**Southern Oregon Traction Company, Medford, Ore.**—This company, which on July 1 purchased the Rogue River Valley Railway, consisting of about 6 miles of track, has built a connecting line of track about 1½ miles between the two railways, along the main street of Medford, and electrified it. About Jan. 1 the company expects to place in operation 6½ miles of electric railway extending from the Opp Mine through the cities of Jacksonville and Medford to the city reservoir. The company also expects to build 30 miles of extension southwest to the California-Oregon lines as soon as the project can be financed.

**Portland & Oregon City Railway, Portland, Ore.**—Operation has been begun by this company between Milwaukie and Carver, the present terminus of the line, which is near Baker's Bridge. It is expected that the line will be completed from Milwaukie to the North Bank Station, Portland, by Jan. 10.

**Milford, Pa.**—It is reported that announcement has been made by J. A. Vandergrift & Company, New York, the engineering firm which is to build the proposed railway between Port Jervis and Milford, that arrangements are so well advanced as to permit actual work to begin very shortly. [Nov. 6, '15.]

**Philadelphia, Pa.**—The two lowest bids received for the construction of concrete column foundations for the elevated railway on Frankford Avenue from Unity to Dyre Street were Edwin H. Vare at \$17,700 and Peoples Brothers, Inc., \$18,499.

**West Chester (Pa.) Street Railway.**—This company is considering the extension of its lines to accommodate the people at the Chester County Home, Mortonville and Modena.

**Manila Electric Railroad & Light Company, Manila, P. I.**—It is reported that this company has been awarded the contract for lighting the entire city of Manila, with the exception of the Paco district, for a period of ten years. The contract provides for ultimately increasing the street lighting units from the present total of 1300 to about 2400.

**Charleston-Isle of Palms Traction Company, Charleston, S. C.**—This company reports that during 1916 it expects to build 1½ miles of 60-lb. T-rail track.

**Columbia Railway, Gas & Electric Company, Columbia, S. C.**—Plans are being made by this company to extend operation to the Wales Gardens section in the near future. Tracks have already been laid.

**Carolina, Greeneville & Northern Railroad, Greeneville, Tenn.**—Announcement has been made by LeRoy Parks, field agent of this company, that plans have been perfected for the beginning of construction work on one section of the proposed railway from Bristol to Knoxville, via Kingsport and Newport. The project has been underwritten by New York financiers, it is stated, and work will be begun at an early date. [Oct. 16, '15.]

**Abilene (Tex.) Street Railway.**—Work has been begun by this company improving the north end of its line. As soon as the north end is repaired work will be begun on the south end. About \$3,000 will be spent on these improvements.

**\*Buena Vista, Tex.**—Plans are being considered by the Pecos Valley Railroad Association for the construction of a gasoline-electric interurban railway from a connection with the Kansas City, Mexico & Orient Railway northwest via Buena Vista for 35 miles up the Pecos Valley.

**Corpus Christi Railway & Light Company, Corpus Christi, Tex.**—This company expects to build 1 mile of new track during 1916.

**Houston, Richmond & Western Traction Company, Houston, Tex.**—The contract for grading the first 100 miles of this company's line between San Antonio and Houston will be awarded within the next sixty days. A branch line will be built from Seguin to New Braunfels. A hydroelectric power plant will also be constructed. E. Kennedy, president. [Nov. 20, '15.]

**Ogden, Logan & Idaho Railway, Ogden, Utah.**—This company reports that during 1916 it expects to build 22 miles of new line from Ogden to Harrisville and from Hot Springs to Brigham City.

**Appalachian Power Company, Bluefield, W. Va.**—A report from this company states that it is contemplating the construction of a 1-mile extension to its line.

**Merrill Railway & Lighting Company, Merrill, Wis.**—Preparations are being made by this company for the erection of a high-tension transmission line from Merrill to Wausau. The plans provide for the development of the Trappe Rapids water-power, owned by the Wausau Street Railroad.

## SHOPS AND BUILDINGS

**International Railway, Buffalo, N. Y.**—The city authorities of Lockport and the International Railway have come to an agreement for better passenger station facilities and have withdrawn their complaint from the Public Service Commission. The company will construct an additional story for the offices of the company and enlarge and otherwise improve the passenger waiting room.

**New York, N. Y.**—Plans are being made for the construction of a new amusement building to occupy the site of the carhouses of the New York Railways on Eighth Avenue between Forty-ninth and Fiftieth Streets. Negotiations for the property have been going on for more than a month between the Panama Canal Exhibition Company and Theodore P. Shonts, representing the railway. The property will be taken on a lease of twenty-one years, with an option of renewing the lease for an equal term of years. The walls of the present structure will be utilized and most of the work of reconstruction will consist of interior changes.

**Eastern Pennsylvania Railways, Pottsville, Pa.**—Work has been begun by this company on the construction of a new carhouse to be located at the rear of the Lansford ball park. The carhouse will be of steel and brick construction and fireproof throughout. It will be large enough to accommodate all the rolling stock on the division. A shop will also be connected with the carhouse.

**Dallas, Tex.**—As announced in the ELECTRIC RAILWAY JOURNAL for Dec. 11, construction will begin about Dec. 20 on the terminal station and office building at Wood, Browder and Jackson Streets, to be used by the Dallas Electric Light & Power Company, Texas Power & Light Company, Southern Traction Company, Texas Traction Company and Northern Texas Traction Company. The structure will be 210 ft. x 85 ft., eight stories, with provision for three additional stories. The building will be of reinforced concrete frame, faced with brick and terra-cotta. Concrete platforms from the waiting-room to the tracks with steel frame overhead coverings will be provided. The terminal yard will contain seven tracks arranged in three pairs with single track and loading platform between. An emergency loop will be constructed from Lane Street through Jackson and Browder Streets to Commerce Street.

## POWER HOUSES AND SUBSTATIONS

**Des Moines (Ia.) City Railway.**—A contract has been placed with the Des Moines Bridge & Iron Company for the construction of a steel water tower for the powerhouse of this company. The tower will cost about \$4,800.

**International Railway, Buffalo, N. Y.**—Two new substations are now in the course of construction by this company and \$150,000 will be spent to increase the capacity of the five substations now in operation. In the spring three more plants will be added to the equipment of the International Railway, making ten substations located in widely separated parts of the city.

**Reading Transit & Light Company, Reading, Pa.**—Improvements are being planned by this company to its West Reading power plant at a cost of about \$300,000.

# Manufactures and Supplies

## ROLLING STOCK

Water, Light & Transit Company, Carrollton, Mo., expects to purchase during 1916 one passenger car body.

Piedmont Railway & Electric Company, Charlotte, N. C., expects to purchase during 1916 two single-truck passenger cars.

Minnesota-Northwestern Electric Railway, Thief River Falls, Minn., expects to purchase during 1916 one 60-ton gas-electric locomotive.

Dominion Power & Transmission Company, Ltd., Hamilton, Ont., is reported as expecting to purchase twelve or more cars in the near future.

Des Moines (Iowa) City Railway, it is reported, will order at once forty front-entrance, center exit cars from the McGuire-Cumming Manufacturing Company, Chicago, Ill.

Charleston-Dunbar Traction Company, Charleston, W. Va., expects to purchase during 1916 one express car, two inter-urban cars and two pay-as-you-enter city cars.

Long Island Railroad, New York, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Nov. 27, 1915, as having issued inquiries for twenty-five new trailer cars, has ordered this equipment from the Standard Steel Car Company.

Salt Lake & Ogden Railway Company, Salt Lake City, Utah, has ordered six large open steel trail cars from the Jewett Car Company, Newark, Ohio. The cars are being bought especially to provide service for the summer Lagoon excursion travel, and will have a seating capacity of eighty passengers.

Petersburg & Appomattox Railway, Petersburg, Va., R. H. Mann, president, has ordered through Stuart, James & Cooke, engineers, New York, ten second-hand motor cars and one work car which were formerly in operation on the system of the Cleveland Railway.

East Liverpool Traction & Light Company, East Liverpool, Ohio, is receiving fifteen center-entrance, low-level motor cars built by the G. C. Kuhlman Car Company, Cleveland, Ohio, which are being shipped on their own wheels and operated under their own power. The cars, eleven of which have been received by the railway, are sent from the plant of the Kuhlman Company at Collinwood, Ohio, over the lines of the Cleveland Railway to Miles Avenue and Broadway, Cleveland, thence over the Northern Ohio Traction & Light Company's property via Silver Lake Junction to Ravenna, Ohio, from there over the Stark Electric Railroad via Alliance to Salem, Ohio, and then over the Youngstown & Ohio River Railroad lines to East Liverpool, a total distance of 110 miles. The crews of the respective roads over which the cars are shipped handle the shipments en route.

## TRADE NOTES

Signal Appliance Association, New York, N. Y., announces receipt of a letter from C. C. Rosenberg, secretary Railway Signal Association, extending thanks for the co-operation of the former association at the annual convention held at Salt Lake City on Sept. 16.

American Brake Shoe & Foundry Company, New York, N. Y., after Jan. 1, 1916, will have its Canadian business handled by the Dominion Brake Shoe Company, Ltd., the entire capital stock of which is owned by the American Malleable Company, a subsidiary of the American Brake Shoe & Foundry Company.

Pelton Water Wheel Company, San Francisco, Cal., announces that Benjamin B. Lawrence, a member of the class of 1878 of the Columbia School of Mines, has purchased the Pelton-Doble water wheel and the Pelton-Francis turbines which were exhibited by this company at the Panama-Pacific International Exposition and presented them to the school.

National Pneumatic Company, New York, N. Y., has received an order from the Interborough Rapid Transit Company for the pneumatic door control of the 311 recently ordered subway cars. This will include 1866 pneumatic door engines, six per car. They will be substantially the

same as the engines for the previous lot of 418 cars now being put in service.

Pressed Steel Car Company, Pittsburgh, Pa., announces the following changes in its organization, effective Dec. 1: N. S. Reeder has been elected vice-president, with headquarters at New York. J. B. Rider has been elected vice-president, with headquarters at Pittsburgh, Pa., and will continue to perform the duties of general manager in charge of operations. J. F. MacEnulty, formerly general sales manager, has been elected second vice-president with headquarters at New York. C. E. Postlethwaite, formerly manager of sales, central district, at Pittsburgh, has been appointed general sales manager of the Pressed Steel Car Company and the Western Steel Car & Foundry Company, with headquarters at New York. H. F. Hoffstet has been appointed assistant manager of sales of the central district, with headquarters at Pittsburgh, Pa.

Western Electric Company, New York, N. Y., in outlining its various developments in telephones and telephone equipment made by this company during 1915, reports that further experimentation and development work on the loud-speaking telephones for railway train dispatching work have resulted in a loud speaker that is an unusual combination of distinct enunciation and large volume. A number of these instruments have been installed during the year on many of the lines of important railroad systems, where they are doing efficient work. An electro-magnetic circuit breaker, known as No. 12020, has been developed to replace the slower-acting fuses used on train dispatching circuits to limit the amount of battery current supplying the telephone and telegraph instruments. The quick-breaking action of the circuit breaker effectually prevents the burning of relay points. The point at which the circuit breaker operates is regulated by adjusting the air gap between the coil core in the armature. The operating range extends to 2 amp. A slate base is used instead of wood base instruments to prevent warping and arcing. A booth switch, No. 1-A, has been produced for use on telephone booths placed at railroad sidings. The switch is connected to the hasp of the booth lock so that it cuts out the siding telephone only when the door is locked. It does not cut out when the door is closed behind the man who is using the telephone. The switch is rugged in construction, has high insulation resistance and is provided with rubbing contacts which keeps the platinum contact points clean.

## ADVERTISING LITERATURE

Newman Clock Company, New York, N. Y., has issued a catalog describing its Grille watch clock for watchmen. These clocks have a large number of users on the Pennsylvania Railroad, and many other railroads.

Railway & Industrial Engineering Company, Pittsburgh, Pa., has issued a folder describing and illustrating the Burke high-voltage horn gap switches and arrester, also its other types of electrical steel work and outdoor substations for all voltages and capacities.

Esterline Company, Indianapolis, Ind., has issued bulletin No. 365 describing an entirely new line of its graphic meters. These instruments are intended for checking up voltage and current on a.c. circuits and have been designed for use where the usual high price of graphic meters is prohibitive.

Kenneth H. MacArthur, Milwaukee, Wis., has issued a folder describing the Lake Superior wrench, which is especially adapted for working effectively in close corners or limited spaces. The jaws and teeth are made of extra hard steel, rendering it especially effective for handling badly disfigured nuts.

Canton Culvert & Silo Company, Canton, Ohio, has issued reproductions of letters of commendation and advertisements of "Acme" nestable culverts. Among the testimonial letters are included those from the Union Traction Company of Indiana, Kanawha Traction & Electric Company, and Cedar Rapids & Iowa City Railway.

Bryant Electric Company, Bridgeport, Conn., has issued a comprehensive and elaborate publication of 168 pages, describing and illustrating its large assortment and variety of wiring devices. The catalog is equipped with a special quick reference index, which is particularly useful in such a bulletin where so many materials and types are described.