

Electric Railway Journal

Published by the McGraw Publishing Company, Inc.
Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

Vol. XLVI

NEW YORK SATURDAY, NOVEMBER 13, 1915

No. 20

SUBSTANTIAL PROGRESS ON SAFETY CODE

After many preliminary conferences held in different parts of the country during the past year the work on the proposed national electrical safety code which is being fathered by the National Bureau of Standards has assumed much greater importance than heretofore through the two-weeks conference held recently in New York. The sessions were marked by earnestness and concentration of purpose and the delegations of the many interests represented contained many of the best-known specialists in the country. Among these interests were the American Electric Railway Association, the American Railway Association, the National Electric Light Association, the National Electrical Contractors' Association, the Association of Edison Illuminating Companies, the Electrical Manufacturers' Club, the Western Association of Electrical Inspectors, the General Electric Company, the Westinghouse Electric & Manufacturing Company, Gibbs & Hill, the Commonwealth Edison Company, and many other associations and commercial organizations. These names are mentioned to indicate the widespread interest in the movement. The proposed code is now being taken seriously by electric power producers, distributors and users. With their co-operation it is being modified to fit the complicated conditions of the business. Unquestionably with the New York conference the code entered upon a new stage in its career. In its revised form it will be much more applicable to commercial conditions than before and should have careful study by every electric railway company.

"RECALLED TO LIFE"—ELECTRIC RAILWAY BUYERS

Our trusty barometer of the industry, the JOURNAL rolling-stock column, like similar columns of our steam railroad contemporaries, seems to be beginning to return to a normal average after a prolonged anemia dating from August, 1914, at the outbreak of the European war. Car orders within the last month have shown a distinct increase both over the same period in 1914 and over any one previous month in 1915, except March, April and May, the regular heavy buying season. The larger passenger car orders recently placed include eighty cars for Cleveland, fifty for Detroit, twenty-five trailers and forty-eight articulated center-sections for the Boston Elevated Railway, thirty-one cars for the Wilmington & Philadelphia Traction Company and ten for the Buffalo & Lake Erie Traction Company. These, with a noticeably high average number of small orders, cannot betoken merely a mushroom activity, especially in view of a correspondingly large number of prospective purchases now current. The

most important of the latter include 311 new subway cars for the Interborough Rapid Transit Company, fifty cars for the Des Moines (Iowa) City Railway, fifteen for the United Traction Company of Albany, thirteen for the Toronto Civic Railway, twelve for the San Francisco-Oakland Terminal Railways and ten for the Trenton & Mercer County Traction Corporation. These prospects are all the more encouraging at this time when many other railways have not yet voted on their expenditures for the coming year. In fact, the period is closing wherein the supply man felt it necessary to pack up his traveling bag and rush off at the slightest wild-cat rumor of an up-state one-car purchase.

WHAT IS THE RAIL HEAD?

When ultimate wear limits for various plain-girder and grooved-girder rail sections are considered it is of prime importance to know what fixes the rail head. For plain-girder rail the head has been defined as that portion of the rail section above the intersection of the two lines forming the underside of the head. Some may venture the assertion that this area is not entirely available for wear, hence a horizontal line connecting the points of intersection of the gage and base lines should be used. Similarly there is a difference of opinion regarding the defined head limits of grooved-girder rail, in fact, if the head of this style of rail has ever been defined it is not a matter of record. In the article on girder and high T-rail renewals, printed in the issue of the ELECTRIC RAILWAY JOURNAL for July 31, page 179, the head of a grooved and tram-girder rail was considered as that portion above the rail-head base line extended to the groove. It was found that in many sections this line was tangent to the bottom of the groove. If that portion of the grooved and tram-girder rail head available for wear is limited by wheel flanges riding on the groove floor, then our limit appears logical. If the wheel flanges are permitted to cut into the groove floor until other complications dictate that a rail renewal should be made, then, perhaps, the rail head should be defined as that portion above the base line of the groove extended across the web. However, the amount of vertical head reduction fixes the depth the wheel flanges can cut into the groove floor, hence there does not appear to be any important reason for including more than the rail head proper. In any event a discussion of this subject would be interesting and a decision may only be reached by obtaining a consensus of opinion. If the rail heads for various sections can be defined, it will then be possible to discuss intelligently the ultimate permissible head reduction in definite terms.

ELECTRIFICATION ON THE PENNSYLVANIA

Electric operation of part of the suburban service at Philadelphia has been inaugurated by the Pennsylvania Railroad, as described on another page of this issue, primarily because of the unusual topographical conditions existing in the vicinity of the terminal in that city. Under steam operation the great Broad Street Station had reached the limit of its traffic capacity, not so much on account of an insufficient trackage in the station itself but rather because of extreme congestion of the approach tracks during the rush hours, this being emphasized by the necessity for handling a heavy suburban service in and out of the city. The terminal is of the stub-end type, and steam locomotives have no means of running around the strings of cars that they bring into the station, having to back out behind the trains and thus duplicate train movements over a restricted approach.

Electrically operated multiple-unit cars are, of course, free from any difficulties involved by the necessity for quick "turning" of suburban trains at the end of the run, and the electrification of some of the suburban lines offered an obvious alternative to a costly enlargement and rearrangement of the terminal. Electric operation, of course, has involved a considerable outlay of capital, but it has the advantage of bringing operating economies sufficient to pay a small interest charge on the investment—something that the extension of the station could not do. The relief that has been thus provided is equivalent to a reduction of 8 per cent in the total number of trains using the station, and this may be extended by electrifying other suburban lines from time to time as required, thus taking care of the normal growth of traffic for several years to come. Here, then, is a reason of sufficient importance to warrant the electrification in question, aside from any considerations of future replacements of steam by electricity.

Nevertheless, it is difficult to avoid the thought that the installation constitutes but a preliminary step in plans of vastly greater magnitude. Based upon the number of passenger trains arriving and departing from Broad Street Station in each hour of the day, there is little to choose between the load factors, or "service factors" (if such a term can be coined), of the suburban service and the through service on the main-line division west of Philadelphia. In addition, the daily total of through passenger trains on the main line to the West is nearly two-thirds of the number now operated by electricity, and on the division north of Philadelphia, which extends to New York, the density of the through service is actually greater than that of the suburban service that has just been electrified. Since both terminals of the latter division are now electrically equipped it would seem logical that they, at least, should be linked together eventually.

Of course, the electrification of through service does not result in all the reductions in operating costs and terminal charges that are inherent in the use of multiple-unit cars. But as opposed to this is the possibility, in trunk-line electrification, of economies through the electric operation of freight trains, which may be sand-

wiched in between the peaks of passenger service to the betterment of the load factor at the power house and the service factor of the expensive distribution and contact system. Theoretically, this advantage should be an ample basis for clinching the argument that, if the suburban service can carry the investment of electrification, a through service of greater density should pay a handsome profit on it, but from the practical standpoint these savings are only a possibility, because their extent has not yet been definitely established.

That such savings are inevitable, of course, cannot be disputed, but until recently the question whether there will be 2 per cent or 20 per cent profit on the investment for an electrification that includes heavy freight service has had to be answered largely by calculations based upon generalities. This, it would seem, should cause hesitancy in undertaking an over-ambitious program in trunk-line electrification, and it is only natural that a thoroughly conservative company like the Pennsylvania Railroad would move with the utmost deliberation in a matter of so large a capital expenditure as that involved by the New York-Philadelphia project. There are, in fact, other divisions on the system where the electric operation of freight trains presents materially greater possibilities for savings, such, for example, as the mountain region of western Pennsylvania. Here the concentration of the large demands for power that are made by the heavy trains on the severe grades works especially to the advantage of electric operation, not only by cutting down transmission distance but also by making full use of the great potential tractive effort of the electric locomotive.

Therefore, it is quite likely that electrification of the through lines on the Atlantic Seaboard will come only after the economy of the electric locomotive in heavy freight service has been demonstrated by an installation on one or more of the grades in the Alleghenies.

ACCOUNTING FOR RENTS

To what extent rental charges should be included in operating expenses or among deductions from income seems to be a perplexing question—one upon which commission classifications show no unanimity of opinion. In general, two distinct methods are followed, as illustrated in the accounting regulations of the Interstate Commerce Commission. For steam railroads only office and minor equipment rents are included in operating expenses, whereas rents for locomotives, cars and other major equipment, trackage rights and leased roads are classed as deductions from income. In the case of electric railways, however, office and other minor rents, charges for joint tracks and facilities, and rents for equipment are deducted as operating expenses, and only rents for leased lines and equipment covered by the leases are charged among the deductions from income. This second method constitutes, we believe, a real advance in utility accounting, secured through the earnest efforts of electric railway accountants, and we do not favor giving it up for the steam-railroad method, as proposed by one speaker before the recent Accountants' Association convention in San Francisco.

When accountant-economists disagree as to the fundamental difference between "operating expenses" and "deductions from income," the only logical course is to forget the hair-splitting of economic thought and to realize that the purpose to be attained by an accounting classification should be the controlling factor in its construction. Now, to our mind, a classification should be so made as to indicate in the clearest and quickest way whether or not a utility is securing a reasonable return on the fair value of its property. By its property we mean all the property that is or would be covered by a valuation in a rate case. The difference between all the direct and indirect revenues from the activities of the company and all the expenses incurred in its maintenance and operation, forms the gross income or actual return upon the fair value of the property. It should be noticed that this term "gross income" is here used in its official technical sense according to the Interstate Commerce Commission classification and not in its somewhat popular sense of total receipts. In order, however, that the gross income figure, as defined, may justly be used to show the real return in comparison with a reasonable return on the fair value, it is necessary as a condition precedent that all rents be classified and accounted for in the income statement in a manner compatible with the way rented property is treated in the valuation total.

While the valuation practices of commissions are not sufficiently standardized to admit of exact generalities, it may be said that usually the valuation of a public utility would include all property that is owned outright or property that is used regularly in connection with the company's own property, of which a long-term lease is usually the concrete evidence, while property whose use is merely temporary or accidental or which is owned and maintained by another corporation primarily for its own purposes, would not be included. For example, rented lines with accompanying equipment held under a long lease would be included in the valuation as the non-owned portion of the operating property, while rented cars and miscellaneous equipment used on a daily basis, lines of other companies used under trackage agreements, office rooms in buildings not owned by the company, etc., would be excluded from the valuation. The difference between included and excluded property items gives the basis for making a distinction in accounting for rents. Rents on items that are excluded from the valuation total must be treated as operating expenses incurred in conducting the company's activities. Rents on items that are included, however, represent a portion of the gross income of the company, a part of the return on its fair value.

In other words, the gross income of a company with leased property consists of three parts. The first part represents the portion of the return that covers the foreign plant included in the valuation. The second and third parts represent the portion of the return upon the company's own property, part being the interest on the funded debt and the balance the stockholders' equity. If the rents for the valued foreign plant were included in operating expenses, the gross income would not show

the real return upon the company's fair value. Nor would such be the case if the various rents on non-valued property were classed as deductions from income. All rent items, therefore, should be treated as operating expenses with the exception of the permanent charges on property held under long leases. This is the present electric railway practice, and we would oppose any reversion to the steam railroad method. If any change is made, it should be by the latter carriers. For those whose economic souls are horrified by classing rents on non-valued property with "true" operating expenses, a concession might be made by combining such items with taxes, etc., as a supplementary group of operating costs, but the main point is to have them deducted before the gross income figure is obtained.

THE AUTOMOBILE NUISANCE

We had occasion last week to refer in these columns to the competition which electric railways suffer from private automobiles, and also to the higher taxes which electric railway companies, in common with all taxpayers, have to pay to provide good roads for pleasure automobile driving. There is another and perhaps an even more serious burden which automobiles are placing upon the public in general and upon the railways in particular which demands radical reform. We refer to the reckless driving of high-powered cars over electric railway crossings and on public highways at speeds which should not be permitted except on a protected right-of-way. This driving is done not only by men who show an utter disregard of even the most elementary safeguards but by minors who would never be permitted in charge of the much more safe operation of an electric car.

If these people who thus run amuck in the public streets risked their own lives only it would not be a matter of such vital importance. But they endanger also, and to a much greater degree, the lives of all other occupants of the streets, and accidents are becoming so common as a result of this practice as to call for stern repressive measures. We have only to instance the testimony given on the recklessness exhibited by automobile drivers at the last two meetings of the Claims Association and the efforts of the Long Island and other railroads to protect their grade crossings from accidents with automobiles to show that a real evil exists. We are glad, therefore, to chronicle this week the fact that the subject is to be taken up seriously under the direction of the Public Service Commission for the Second District, New York, by a committee composed of electric railway managers, representatives of the commission and officials of three of the State automobile associations.

The committee has a task of great magnitude ahead of it. Those whom it will have to control have had freedom so long to do about as they pleased, but we hope that the committee will recommend to the Legislature severe penalties for the misuse of the highways and the neglect of safety precautions at electric railway crossings which has been so common on the part of automobile drivers since the advent of the high-powered car.



PHILADELPHIA-PAOLI ELECTRIFICATION—VIEW OF CROSS-CATENARY OVER NINE TRACKS, SHOWING READY VISIBILITY OF SEMAPHORE SIGNALS NOTWITHSTANDING COMPLICATED OVERHEAD CROSS-OVERS

Philadelphia-Paoli Electrification

Operation of This 20-Mile Suburban Electric Zone Has Been Begun by the Pennsylvania Railroad with Multiple-Unit Cars Having Repulsion-Starting, Series Motors, Single-Phase Power Being Supplied from an 11,000-Volt Catenary Contact System Carried on Cross-Wire Bridges

The recent establishment of regular suburban service over the single-phase electric zone of the Pennsylvania Railroad at Philadelphia marks an important step in the electrification plans of that company and makes a description of the details of the installation particularly timely. At present the electrified tracks extend only from the Broad Street Station in Philadelphia to Paoli, 20 miles to the west on the main line, but work is under way also on the electrification of the Chestnut Hill line, 12 miles northward from Philadelphia. Both of these installations, as outlined in an account that was published exclusively in the *ELECTRIC RAILWAY JOURNAL* for April 18, 1914, were projected primarily to relieve congestion at Broad Street Station, and it is expected that they will take care of the normal growth of traffic for the next seven or eight years.

For the Philadelphia-Paoli service the rolling stock consists of ninety-three standard all-steel cars, eighty-two of which are for passenger service, nine for combined passenger and baggage service and two for combined baggage and mail service. All are motor cars, as no trailers are operated on the electrified suburban runs. Trains of from two to seven cars are operated regularly, the average acceleration on a straight level track being approximately 1 m.p.h.p.s. up to 30 m.p.h., with a balanced speed of 60 m.p.h.

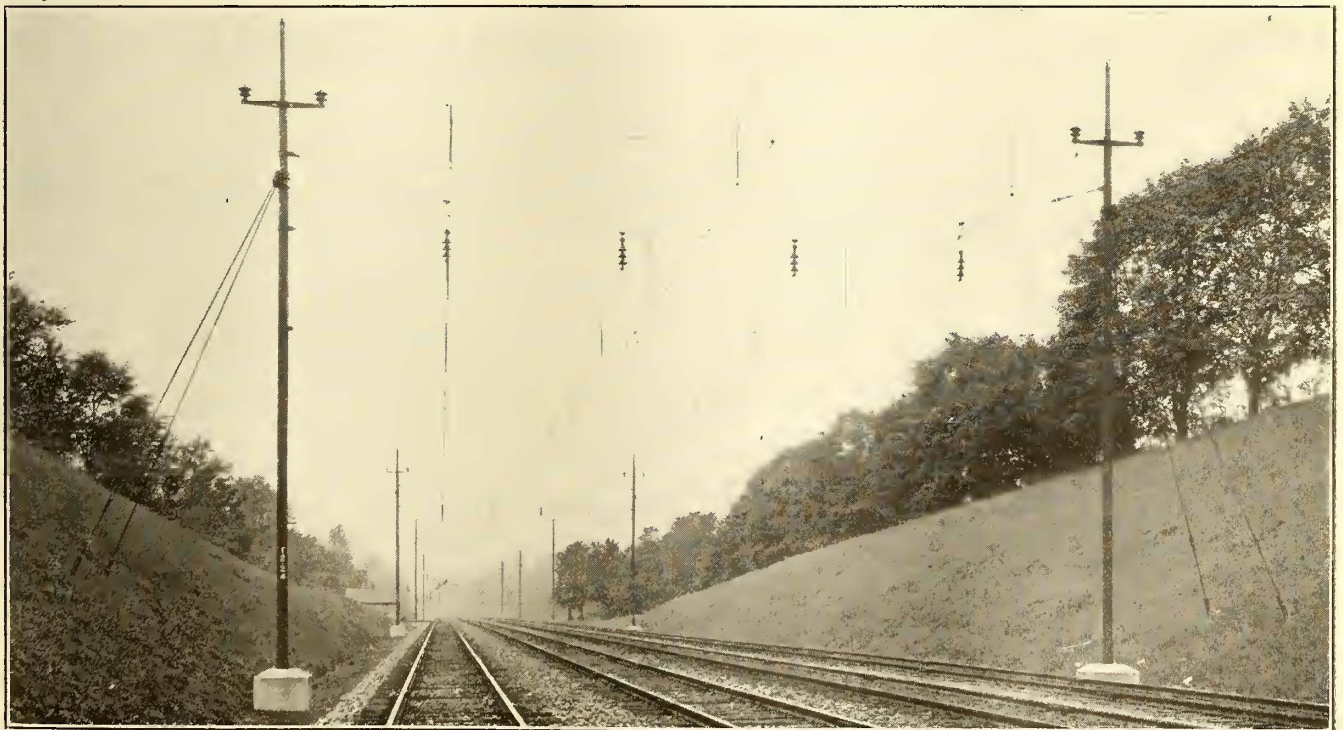
ELECTRICAL EQUIPMENT ON CARS

The equipment of each car consists of two 225-hp. Westinghouse single-phase, air-blast-cooled motors mounted on one truck. Automatic acceleration is provided with the control, and automatic multiple-unit electro-pneumatic brake equipment has been installed. All of the main pieces of the electrical apparatus are mounted on one end of the car and the brake equipment

is mounted at the other end. This gives an uneven weight distribution on the two trucks, approximately 60 per cent of the total car weight being on the driving wheels. The cars are designed for double-end operation.

The motors, which are connected in series, are started and operated up to approximately 15 m.p.h. as repulsion motors, with the auxiliary or compensating field, the armature and the main field in series. With these series connections the armature is short-circuited through resistance. Resistance is also inserted in series with the motors on the first step and is cut out on the second step. The third step changes the connections to energize the auxiliary field from one portion of the transformer and the armature and main field, connected in series, from another portion of the transformer, thus affording doubly-fed connections. The armature short-circuit is removed when the motors are operating with the double feed. Subsequent steps in the control are obtained by increasing the motor voltages.

Power for the control system is supplied in the usual manner from a motor generator set, which is in parallel with a storage battery, through a control plug, and the movement of the master controller handle to the right or to the left energizes the proper control circuit for forward or for reverse movement of the train. The closing of the unit switches is governed by a current limit switch which has two settings, one for repulsion connections of the main motor and the other for the doubly-fed connection, the change in the limit setting being obtained by energizing a battery coil on the limit switch. All of the switches are interlocked through the No. 9 switch, so that no switches can close until the No. 9 switch is closed. A small knife-switch is placed in the control circuit of the No. 9 switch, and opening this switch cuts off the supply of current to the main



PHILADELPHIA-PAOLI ELECTRIFICATION—STANDARD CATENARY CONSTRUCTION ON TANGENTS

motors. Ten control wires between cars are necessary to operate cars in trains, one of these wires performing in the dual function of the third operating wire and the "trolley unlock" wire.

Each motor has a continuous rating of 200 hp. when ventilated with 1200 cu. ft. of air per minute. The armature is of standard construction, the commutator and the laminations being mounted on the spider, the former being undercut 1/16 in. The armature is wave-wound and cross-connected, and no resistance leads are used between the windings and the commutator. The field windings consist of two entirely independent sets of coils, one being the main field circuit for producing the effective magnetic field, and the other the auxiliary or compensating winding which balances the armature reaction on the field. In addition, the latter has a neutralizing effect on the sparking voltage. The field consists of six poles, the coils being of copper bars suitably insulated, connected at the ends by straps.

Flexible gears are used, the gear ratio being 24 : 55. Each gear is made up of a rim on which the teeth are cut, a center, a cover plate and spring details. The rim is spring-mounted on the center, the periphery of the center and the cover plate acting as the bearing surfaces for the rim.

One pantograph of especially light construction is installed on each car. The springs which raise it are designed to give flexibility to the framework, so that in operation a slight dragging of the contact shoe takes place, resulting in its following the wire much closer than with a rigid framework. In addition, the shoe is spring-mounted on the framework. The pantograph is provided with four insulators suitable for 11,000-volt service, and the whole mechanism is mounted on a base provided with insulators similar to those of the pantograph, thus providing double insulation. The pantograph is lowered and unlocked by air at 70-lb. pressure, a small hand pump being provided for unlocking it when no air pressure is available.

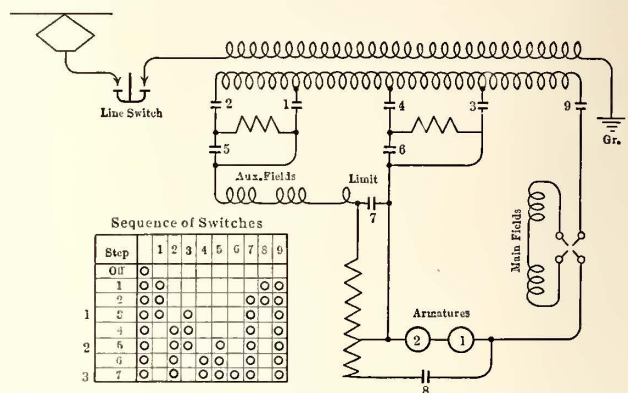
The safety-first principle has been carried out in the provision of a grounding device of novel design. Steps for mounting to the roof are provided at one corner of the car only, and a lever is placed on the roof at this corner. When one climbs to the top of the car this lever is thrown up, thus locking the trolley in the down position and grounding the entire framework.

REPULSION MOTOR PRINCIPLES

In American practice it has not been customary heretofore to short-circuit the armature of an a.c. commu-

tator motor, and the adoption of this plan in the Philadelphia-Paoli electrification for even a part of the accelerating period is of more than passing interest.

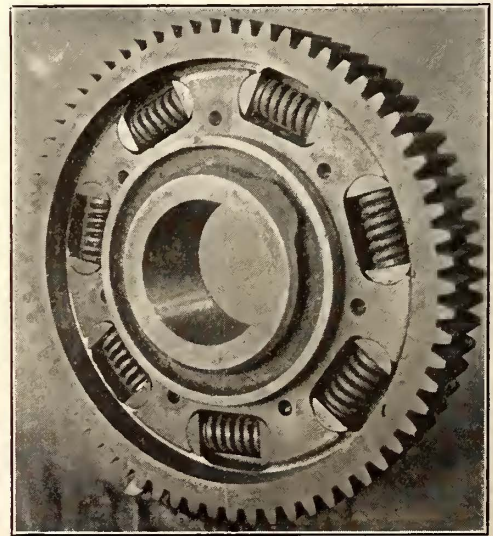
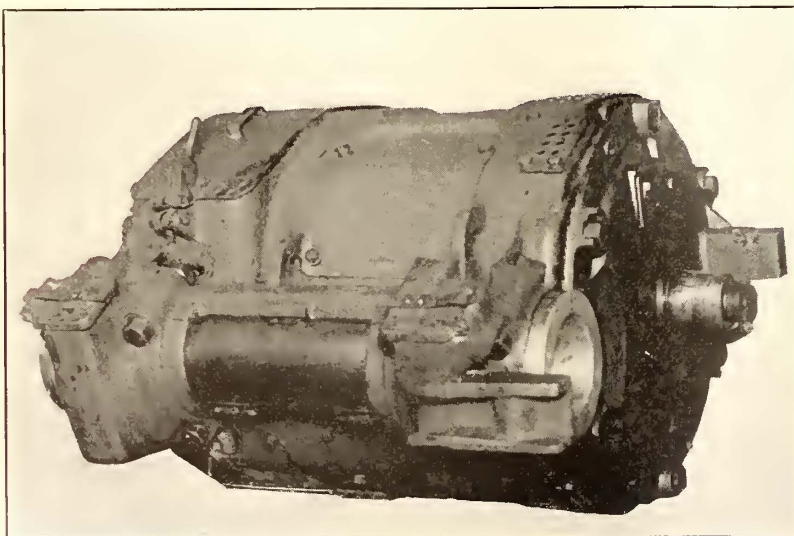
The invention of the repulsion motor is due to Prof. Elihu Thomson, who more than twenty-five years ago developed the scheme shown diagrammatically at A in the diagram on page 983. This diagram represents a two-pole motor having field coils wound on laminated



PHILADELPHIA-PAOLI ELECTRIFICATION—SCHEMATIC DIAGRAM OF REPULSION MOTOR CONNECTIONS

field cores and connected to an a.c. supply line, an armature with brushes and coils connected to the commutator bars as in a d.c. motor, and a connection short-circuiting the brushes. The brushes are shifted from the normal position as shown.

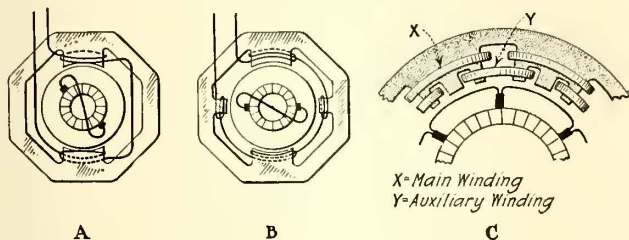
If the brushes were placed under the middle of the field poles the magnetic field flux would pass transversely through the spaces inclosed by the armature coils and a current would flow between brushes, because the passage of alternating magnetic flux through a loop of wire sets up current flow in the wire, in accordance with the well-known principle on which a transformer operates. The short-circuiting of the brushes would permit a current that would be limited only by the impedance of the electric circuit. This flow of current in the short-circuited coils would set up torque, because each conductor would be within a magnetic field. No net torque would be produced, however, because the current would flow in the armature conductors in opposite directions on opposite sides of the brushes and the torques produced on the two sides of the armature would balance each other. But if the brushes are shifted as shown in diagram A, the bal-



PHILADELPHIA-PAOLI ELECTRIFICATION—VENTILATED REPULSION MOTOR—FLEXIBLE GEAR WITH COVER PLATE REMOVED TO SHOW SPRINGS

ance is disturbed and net torque is produced, because the torque of the windings on one side of the brushes overcomes the lesser torque of the windings on the other side.

The principle of the repulsion motor can be explained also by means of the second diagram, shown at B. This motor is equivalent in every way to the preceding. Here the winding is represented as divided into two parts, main and auxiliary coils, one furnishing the field for the production of torque and the other inducing the armature current. It is evident that the compensating winding used in the a.c. series motor, shown crudely in principle in C, could be used as an



PHILADELPHIA-PAOLI ELECTRIFICATION—DIAGRAMS ILLUSTRATING REPULSION MOTOR PRINCIPLES

auxiliary winding, to produce a shifting of the magnetic field equivalent to a shifting of the brushes. A series motor can therefore be readily adopted to repulsion starting.

In the Philadelphia-Paoli motor the original scheme of Professor Thomson is still further modified by the addition of the series connection of armature and field. The armature and field windings are therefore both "conductively" and "inductively" connected. To the extent, however, that current is induced in the short-circuited armature because of the transformer effect of the auxiliary winding it is a repulsion motor. On account of the low resistance of the armature short-circuit the induced current during the starting period has a high value.

ELECTRO-PNEUMATIC BRAKE

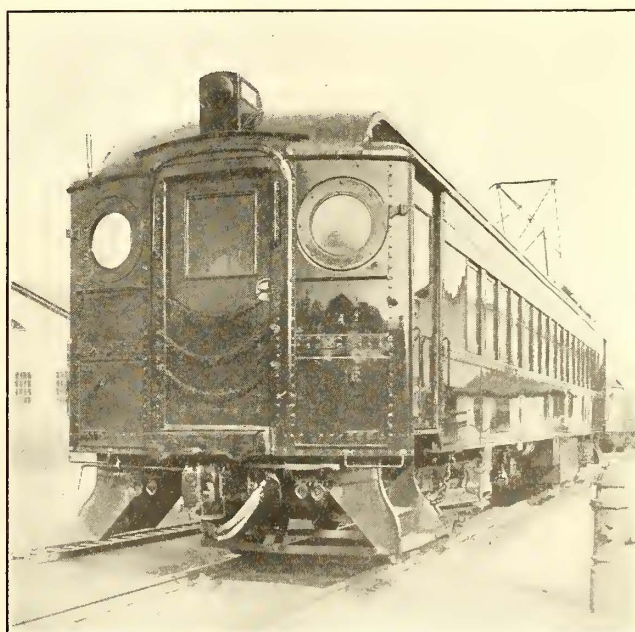
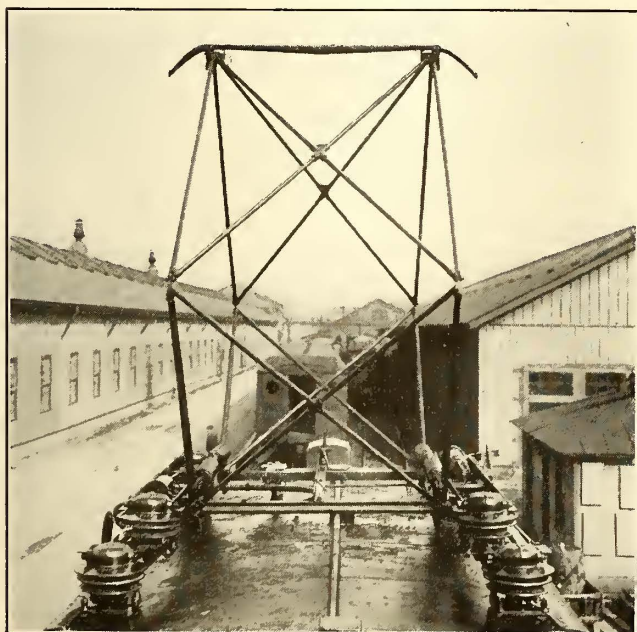
The air-brake equipment on the cars is designed to be used either in steam or electric service, and differs

from the ordinary pneumatic brake in that the brake pipe reduction is made on each car by means of electric control instead of being made entirely with the engineer's brake valve. The addition of electric control to the pneumatic brake does not change its function in any way, but shortens the time required to get the brakes applied on all cars.

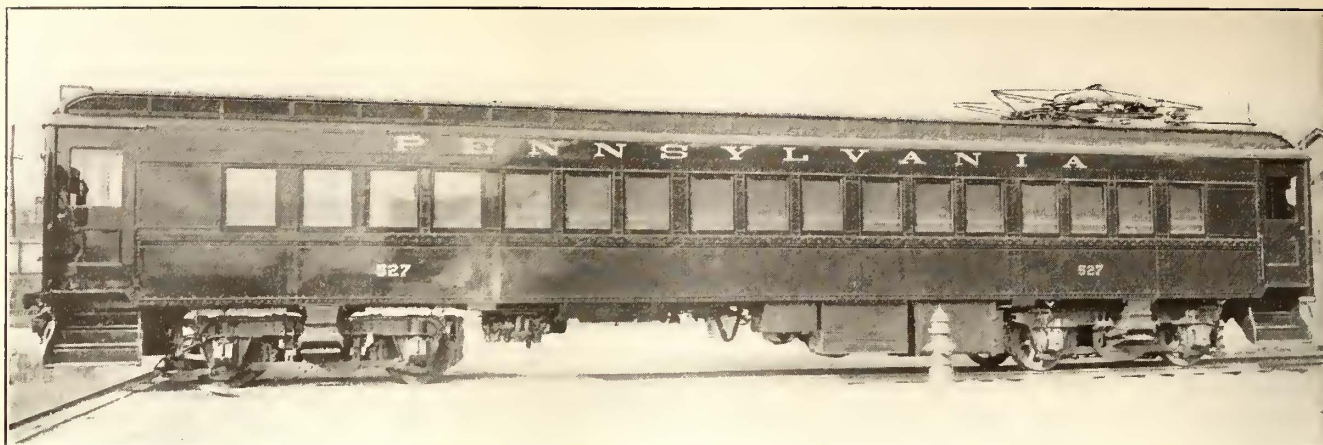
The motorman's brake valve contains both electric contacts and pneumatic parts, the electric portions being mounted above the pneumatic portions. There are six positions: (1) The release and running; (2) the electric holding; (3) the handle off; (4) lap; (5) service, and (6) emergency. The first-named position is to the left and in this position all train brakes are released and the system charged. The "electric holding" position, as the name implies, holds the train brakes through the electric control system, but recharges the system. Pneumatically this position is identical with the release and running position. All ports are closed in the "handle off" position, and the handle may be removed, and in the "lap" position the ports are also closed. The "service" and "emergency" positions are the regular ones for setting in service or emergency applications. For the service application a limiting valve is provided in conjunction with the brake valve, and this allows a maximum reduction of 20 lb. in the brake pipe. A small cut-out plug is provided for cutting out the electric operation when desirable.

The universal valve is built up of five different portions: (1) The pipe bracket, which contains a quick-action chamber and a quick-action closing chamber for use in emergency application; (2) the equalizing portion, which contains the moving parts employed in service and emergency operation; (3) the quick-action portion, which contains the moving parts employed in producing quick action; (4) the high-pressure cap, which contains the parts employed in securing a high cylinder pressure in an emergency application, and (5) the magnet brake portion, which contains the magnet valve for electric control of brake operation, an emergency switch, and a cut-out cock. This universal valve controls the charging of reservoirs, the application of brakes and the release of brakes. It is mounted at the side of the car near the trailer truck.

The main reservoir pressure is 100 lb. and the brake-



PHILADELPHIA-PAOLI ELECTRIFICATION—PANTOGRAPH WITH DOUBLE INSULATION ON CAR ROOF—END VIEW OF STANDARD CAR



PHILADELPHIA-PAOLI ELECTRIFICATION—STANDARD MULTIPLE-UNIT CAR

pipe pressure is 70 lb. To permit the operation of these equipments in steam service, where the brake-pipe pressure is 110 lb., without making adjustment, a main reservoir by-pass and limiting valve is employed. By its use the same cylinder pressure is secured in making an emergency application in either steam or electric service, although the operation of the universal valve is the same for either. In steam operation the pipe line, which is used as a main reservoir line in electric service, is used as a signal line.

Eight wires, including the battery plugs, and ground wires are required for the electric control of the brakes, for governor synchronizing and for train signaling. Since the two battery wires are common to the brake control and the unit switch control, a seven-point receptacle and jumper is used to carry the brake control wires. Two receptacles are mounted on each end of the car and on each side of the coupler, and these are connected in multiple in the same way as the nine-point receptacles for the unit switch control.

CAR-INSPECTION BUILDING

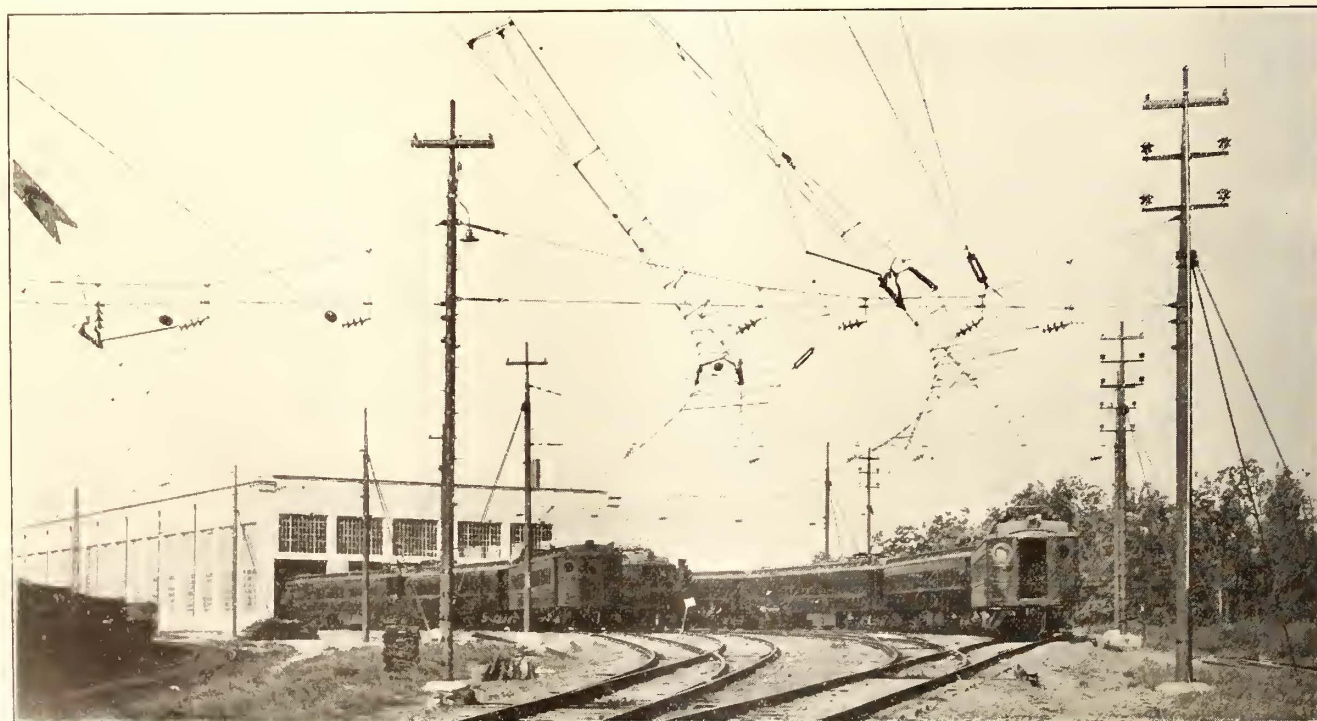
A very substantial and completely-equipped car-inspection building has been constructed at the Paoli yard.

This has been planned to serve not only the cars required for the present electrification, but also for the cars required by other divisions when electrified. Adjacent to the inspection building proper is a small service building, which contains boilers for heating, locker and wash rooms, air compressors and motor generators for supplying power for the tools and signals. Current for the operation of the motor generator sets is obtained from the Paoli substation, in which are located two 11,000/2200-volt transformers.

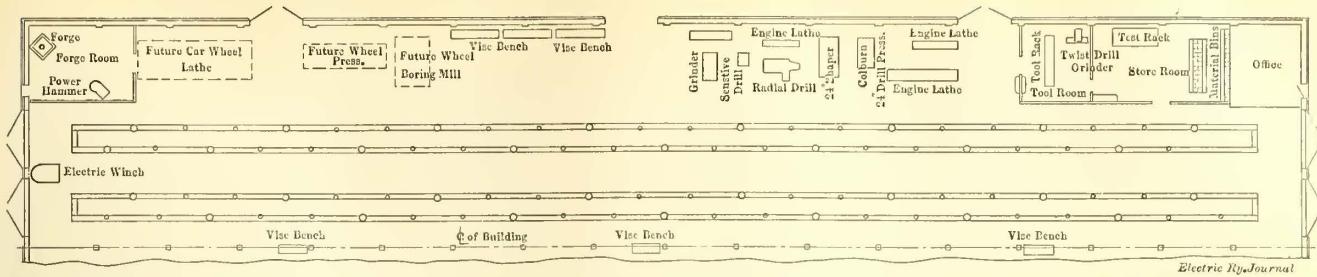
POWER SUPPLY AND TRANSMISSION

Power for traction purposes is purchased from the Philadelphia Electric Company and is generated in its main power station at Christian Street on the easterly bank of the Schuylkill River about 1 mile south of the West Philadelphia passenger station. It is delivered to the railroad company at a substation at Arsenal Bridge, on the westerly bank of the Schuylkill River, opposite the main generating station, the connection between the power house and the substation consisting of armored submarine cables under the river.

While the present service is on one phase only of the power company's three-phase generating system, the



PHILADELPHIA-PAOLI ELECTRIFICATION—SHOP AND INSPECTION BUILDING AT PAOLI

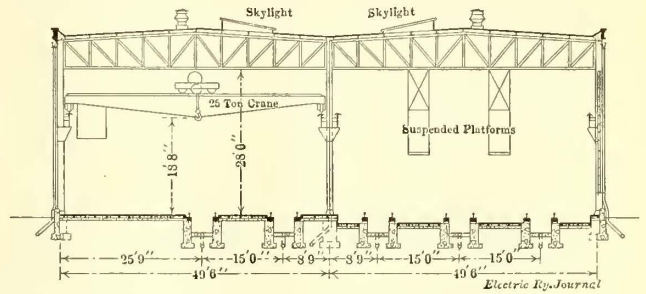


PHILADELPHIA-PAOLI ELECTRIFICATION—HALF PLAN OF INSPECTION BUILDING SHOWING ARRANGEMENT OF SHOP SECTION

plan is to supply succeeding electrifications from the remaining phases. The power is delivered to the railroad company's substation at 25 cycles and 13,200 volts. Here it is stepped up to 44,000 volts, and by means of duplicate single-phase overhead circuits is transmitted to the step-down substations. Special provisions have been made by the Philadelphia Electric Company to balance this single-phase load as well as to correct for the relatively low power factor in order that the full three-phase capacity of the generating units may be available.

From the Arsenal Bridge substation four 44,000-volt single-phase transmission lines extend to the West Philadelphia substation. These four lines will tee into the West Philadelphia substation and two of them continue on to the Bryn Mawr and Paoli substations. The other two lines will later go to the Chestnut Hill substation. The four transmission lines are carried on brackets on the side of the elevated structure between the Arsenal Bridge substation and the West Philadelphia substation, but beyond the West Philadelphia substation they are carried on the catenary supporting structures. Along the right-of-way the lines are carried on both sides of the tracks.

The transmission lines are No. 00, seven-strand, hard-drawn copper wires. They are spaced 5 ft. apart where the two wires of a single-phase feeder are on the same cross-arm, and where there is more than one circuit on a pole the vertical spacing is 3 ft. 6 in. The lines are protected by a 3/8-in. steel ground wire on the top of the poles. Where the transmission lines pass under

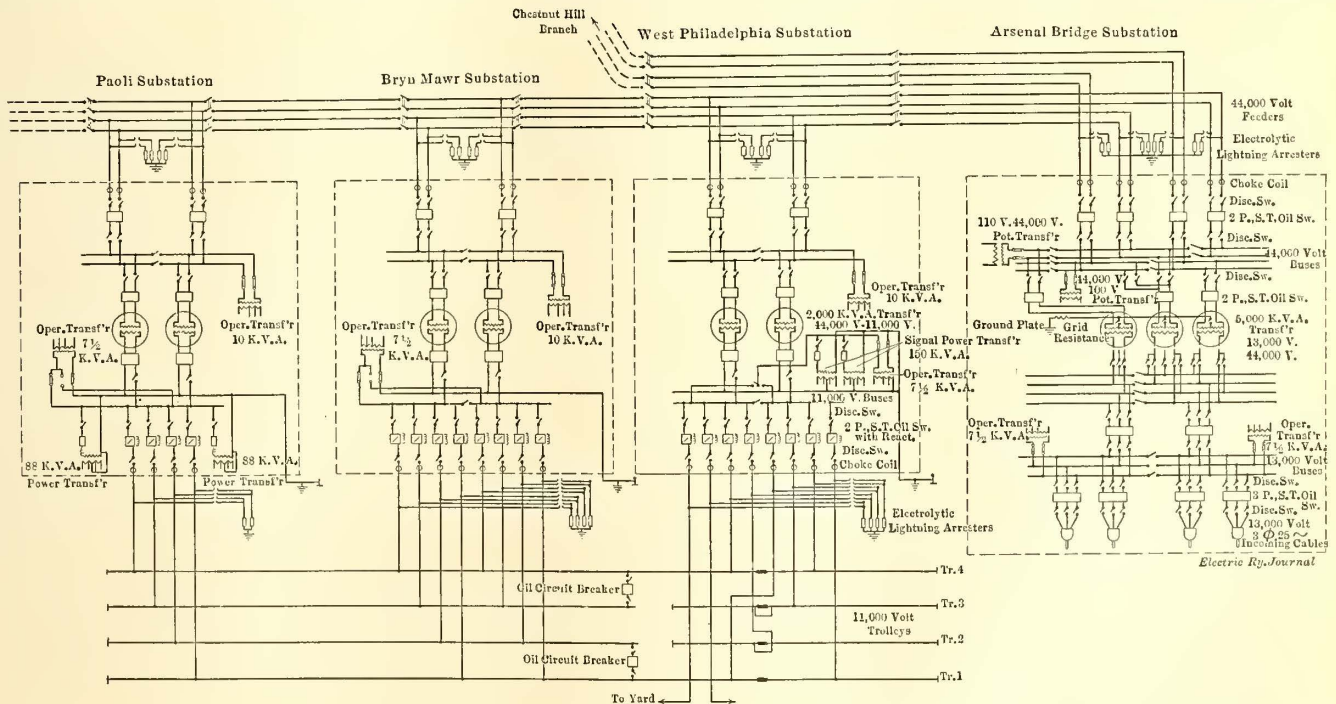


PHILADELPHIA-PAOLI ELECTRIFICATION—CROSS-SECTION OF INSPECTION BUILDING

highway bridges the ground wire is dead-ended on the bridge structure and the wires carried on post-type insulators.

Where the lines pass under the Belmont and Girard Avenue bridge, which approaches tunnel conditions on account of its width, they are covered with rubber and varnished cambric insulation. The joints between the bare and insulated wire either side of the bridge are made outside of porcelain sleeves filled with compound. The wire is continuous throughout the sleeve, the insulation being tapered off inside the sleeve.

At the Arsenal Bridge substation the lines are protected by relays which operate on overload and on an unbalanced load on either side of the circuit caused by a ground. In the other substations the relays operate only differentially, and in case of a ground between substations, the circuit on which the trouble occurred



PHILADELPHIA-PAOLI ELECTRIFICATION—GENERAL WIRING DIAGRAM FOR SUBSTATIONS AND TRANSMISSION SYSTEM

would be cut out first in three of the substations, and finally at the Arsenal Bridge substation. Overload relays are provided in the 13,200-volt lines at the Philadelphia Electric Company's power station, and there are reverse current relays in these feeders in the Arsenal Bridge substation.

The pin-type porcelain insulators used on the transmission lines are 8 7/16 in. high and 12 in. in diameter, made up of four parts. These insulators withstand tests for dry flashover at 165,000 volts, for wet flashover at 120,000 volts, and for puncture at 250,000 volts. After erection the complete transmission lines were tested out to ground at a potential of 66,000 volts, or far in excess of the working pressure.

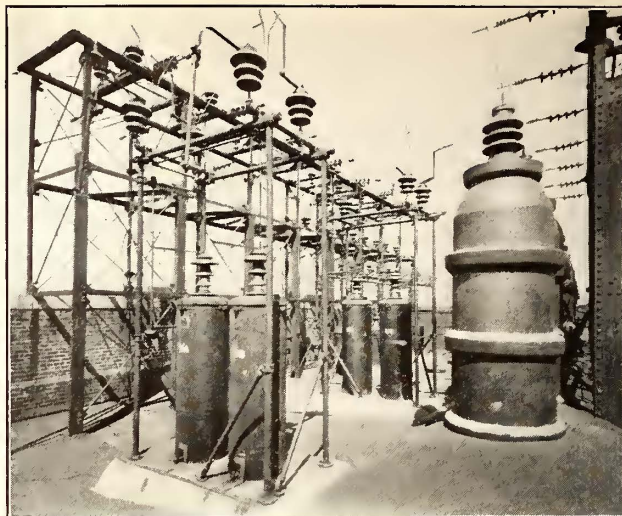
SUBSTATIONS

Transformer substations are provided at suitable points along the 93 track-miles of electrified railroad for stepping up the voltage for transmission and for reducing it to that required in the contact conductors. These are substantial fireproof brick buildings adjacent to the tracks. Electrolytic lightning-arrester equipment and high-tension-feeder sectionalizing switches are located on the roof, the busbars and switching equipment on the second floor, and the transformers on the ground floor. Space is provided in all substations for 100 per cent increase in capacity. The installed capacity of the substations are as follows:

Arsenal Bridge	Three 5,000 kva. step-up transformers
West Philadelphia	Two 2,000 kva. step-down transformers
Bryn Mawr	Two 2,000 kva. step-down transformers
Paoli	Two 2,000 kva. step-down transformers

The transformers in all substations are of the 25-cycle, single-phase, oil-insulated, water-cooled type, with the usual voltage taps on the primary and secondary coils. They were furnished, together with the switching equipment, by the Westinghouse Electric & Manufacturing Company. The cases are mounted on wheeled trucks, and in each substation a transformer truck and chain hoist are provided for handling the transformers and cores. Thermostats have been provided to operate an alarm bell in case of high temperature in the transformers. Oil filtering and drying apparatus is located in each substation.

The neutral point of the high-tension winding of the step-up transformers is grounded through a grid re-



PHILADELPHIA-PAOLI ELECTRIFICATION—LIGHTNING ARRESTERS AND HIGH-TENSION WIRING ON SUBSTATION ROOF

sistance, thus limiting the potential to ground from either side of the 44,000-volt transmission lines to 22,000 volts. All 44,000-volt circuits are connected to the buses in the various substations through oil circuit breakers with boiler-plate tanks arranged along the floor without barriers.

The circuit breakers of the 11,000-volt and 13,200-volt circuits are of the oil type, those on the 11,000-volt trolley circuits having two poles with a reactance connected across one pole. The circuit breakers are automatic and remote controlled.

Open buses mounted on insulators and carried by pipe framework are used throughout. In general, all power wiring is bare, and copper tubing or solid wire is used, sufficient clearance having been provided so that no barriers are required between buses or wires except in the case of the incoming cables from the Philadelphia Electric Company in the Arsenal Bridge substation. Control, instrument and lighting wires are rubber insulated and run in conduits. The 44,000-volt and 11,000-volt buses are sectionalized in each station, normal operation being carried on with these bus-disconnecting



PHILADELPHIA-PAOLI ELECTRIFICATION—VIEW OF SUBSTATION SHOWING ARRANGEMENT OF 44,000-VOLT TRANSMISSION CABLES AND 11,000-VOLT FEEDERS



PHILADELPHIA-PAOLI ELECTRIFICATION—INTERIOR VIEW OF SECOND FLOOR OF TYPICAL SUBSTATION SHOWING BUSBAR AND SWITCHING EQUIPMENT

switches closed, and in the step-down substations one transformer is connected to each side of the bus. One leg of the 11,000-volt side of all step-down transformers is connected to a bus through a disconnecting switch, this bus being connected to the track rails.

Low-voltage power for the opening and closing of oil circuit breakers is obtained from the 25-cycle buses, but 60-cycle power is also provided in all substations to trip circuit breakers in case of the loss of the 25-cycle traction power.

Except in the West Philadelphia substation, where the power director, or system operator, is located, there are no attendants. A switchboard with the necessary instruments, controllers and indicating lamps is provided in signal towers near the Arsenal Bridge, Bryn Mawr and Paoli substations. This board is connected with the board in the substation through a control cable, and the opening and closing of circuit breakers is done by the interlocking plant operator in the tower. Telephones are provided in all substations and in the signal towers controlling them, so that the power director is in constant touch with all substations and tower men. An alarm bell connected to the thermostat on the transformers is located in each signal tower.

CATENARY SYSTEM

One of the notable features of the installation is the use of what are called the "tubular cross-catenary bridges" for carrying the contact wires. This construction was described in detail in the *ELECTRIC RAILWAY JOURNAL* for April 18, 1914. In brief, it consists of National tubular steel poles on either side of the tracks grouted into concrete foundations and anchored by double guys that are made of steel rods with turnbuckles. Spanning the tracks between the poles are two cross wires that form a cross-catenary support for the longitudinal wires.

The cross wires are of Roebling's extra-high-tension galvanized-steel strand, the upper strand usually being $\frac{3}{4}$ in. and the lower one $\frac{1}{2}$ in. in diameter. Both are socketed at each end, and at one side a turnbuckle is

installed to permit of adjustment. The top and bottom cross-wires are joined together by means of a vertical $\frac{3}{4}$ -in. rod and suitable malleable iron clamps at the points where insulators carrying the longitudinal wires are located. Each insulator consists of three suspension-type units made by the Locke Insulator Manufacturing Company, the porcelain being 8 in. in diameter and the flashover value of the three being many times that of the line voltage.

The cross-wire bridges are located about 300 ft. apart on tangents, but are closer on curves, the exact spacing depending upon the degree of track curvature. Insulators are suspended over the center of each track, being offset toward the outside of the curves. The main messenger wire, which is strung out and suspended from the insulators, is a $\frac{1}{2}$ -in., extra-high-tension, seven-strand, double-galvanized steel cable, having a sag of 5 ft. in a span of 300 ft. At intervals of approximately 1 mile this messenger is socketed and dead-ended on one of the heavy structural signal bridges which are spaced about $\frac{1}{2}$ mile apart. The messenger is insulated from the signal bridge by using two or more sets of three-unit suspension type insulators, these insulators being similar to those used for suspending the messenger from the cross-wire and other bridges.

Every 15 ft. on curved track and 30 ft. on tangent track a hanger supports the lower two wires from the messenger wire. The top one of these two wires, called the auxiliary messenger, is of No. 0 round copper, and its purpose is to give suitable current capacity to the system. The contact or trolley wire is a No. 000 grooved phono-electric conductor furnished by the Bridgeport Brass Company. Both wires are carried in a vertical plane, generally about 22 ft. above top of rail, except where they drop down to pass under an overhead highway bridge having insufficient clearance to permit this height.

In the terminal division, which includes the first 5 miles from Broad Street Station, and where the dense steam locomotive traffic causes a great deal of smoke and corrosive gas, a non-corrodible tube hanger is used.



PHILADELPHIA-PAOLI ELECTRIFICATION—TYPICAL CATENARY CONSTRUCTION ON SHARP CURVE

The hanger tube, which is 9/16 in. outside diameter and made of No. 18-gage metal, is fastened to a casting at each end by rolling or crimping the tube into grooves turned in the shank of the casting. Some of the tubes are of Monel metal, while others are composed of a bronze mixture containing 90 per cent copper.

On the Philadelphia division, where there is relatively less steam traffic, wrought-iron strap hangers 1 in. wide by 3/16 in. thick are used. The main messenger cable at the hanger clip is protected from corrosion by a collar of zinc inside of the annealed brass or Monel metal clip, which is bolted to the hanger strap. The flat-strap hangers, which have a quarter turn in them to minimize the area exposed to the wind in the direction crosswise with the tracks and to resist bending when placed on curves, are bolted to the castings that clamp the auxiliary messenger and trolley wires.

On tangents the castings at the bottom of the hangers hold only the auxiliary messenger, and the trolley wire is, in turn, supported from this auxiliary messenger every 15 ft. at points equidistant from the hanger. This insures a very flexible or smooth riding trolley wire.

On curves the two lower wires do not hang directly beneath the messenger, but the whole system swings into a curved plane until a balance is reached between its weight and the tension in the wires. The tensions in both the auxiliary messenger and trolley wires are selected so that in extreme hot weather there will be enough tension to prevent sagging, and yet in extreme cold weather the contraction will not cause stresses beyond the elastic limit.

The catenary system over each of the four main tracks is separated electrically from those over the other tracks, and trolley sectionalizing points with switches are provided at all cross-overs so that sections of the line may be temporarily cut out of service for repairs. On the main running tracks sectionalizing is of the "air-break" type, wherein the two ends of the trolley wire are spread apart, each end being lifted up at a different point, and an insulator is placed in each wire at a point above that where contact is last made with

the pantograph. Thus, while the pantograph is making contact with one wire the other is lifted up and sectionalized.

At cross-overs and in yards the trolley wires are sectionalized by means of wood stick insulators that have runners or gliders on each side, these being so arranged that, while the pantograph always makes contact with at least one of the runners, they are separated electrically. The switches are of the disconnecting knife type, mounted on top of the wood section insulators, and are operated from the ground by means of a long impregnated wooden switch stick.

An interesting detail in the erection of this catenary work was the use of cars, the top platforms of which could be readily raised or lowered by means of chain hoists. The cars were also equipped with removable outriggers so that in the four-track section the work could be completely erected over one of a pair of tracks without in any way interfering with the regular steam traffic on this track.

The electrified route is crossed in many places by overhead highway bridges of restricted height, and in such cases, where it was impracticable to raise the highway bridge, the trolley wires had to be carried underneath, each catenary system being steadied by being held with post-type insulators supported by brackets on the bridge structure. The transmission wires on either side of the main line tracks are also carried down underneath the bridge and supported from the bridge structure by insulators, the metallic brackets carrying the insulators being carefully bonded together and earthed by means of ground plates. To prevent pedestrians on the bridges from contact or interference with the wires, there have been erected solid wooden fences, either vertical or inclined, of sufficient height to shut out all view of the wires. To protect the trainmen, general orders have been issued that no employees are allowed on top of any car in the electrified zone.

TRACK-BONDING, SIGNALS AND TELEPHONES

Throughout the electric zone the rails are bonded with pin-type expanded-terminal bonds furnished by the



PHILADELPHIA-PAOLI ELECTRIFICATION—TYPICAL ANCHOR AND SIGNAL BRIDGE LOCATED AT END OF CURVE; TRACK-BOOSTER TRANSFORMERS MOUNTED AT BOTH SIDES

American Steel & Wire Company, the Electric Service Supplies Company and the Ohio Brass Company. One end of the bond has a terminal solidly welded to the bond while the other end has a soldered terminal. This enables the bond to be installed by being slipped back of the splice plate without the necessity of removing the plate. Each rail joint has two No. 0 bonds, but through the interlockings only one rail of each track is bonded, although all of the traction rails are connected together.

To minimize the inductive effect of the traction currents on adjacent telephone and telegraph wires, series or track-booster transformers have been mounted on the signal bridges at approximately 1-mile intervals. Details covering the method of operation of this scheme were published in the *ELECTRIC RAILWAY JOURNAL* for May 2, 1914. The need for this equipment, however, applies only to commercial circuits in towns along the route, because the railway company has had all wires along the right-of-way installed underground for some time, this action having been taken subsequent to the heavy sleet storm of March, 1914, which did a great deal of damage to overhead wires throughout the Eastern States.

In the electrified portion of the Philadelphia division, about 15 route-miles of four-track line, the old form of semaphore signals have been replaced by position-light signals made by the Union Switch & Signal Company. With these different rows of five lights each indicate the various positions of clear, caution and stop, the mechanical operating device being replaced by relays and Kerite wire. The signals are operated by 60-cycle current track circuits in the usual manner, but to nullify the induction effect of the traction current in the signal circuits of adjacent tracks, resonant shunts have been installed which permit the local induced currents to be shunted around the track relays and thus avoid disturbing the signal circuits.

In addition to the usual telephone facilities between substations and between the electric power director and the train dispatchers, there are permanent telephone boxes located at every signal bridge, approximately $\frac{1}{2}$ mile apart, throughout the electrified zone. In consequence prompt and reliable intercommunication by telephone is possible between any parts of the whole system.

ENGINEERING AND CONSTRUCTION

The design and construction of the electric installation was carried out by Gibbs & Hill, consulting electrical engineers for the railroad company, in co-operation with the engineering department and the officials of the railway. All construction except that of the substation buildings and inspection building, which were covered by outside contracts, was carried out by a specially organized force. The mounting of the multiple-unit car equipment on the cars was carried out by the railroad forces at the Altoona shops under the direction of the motive power department, and the signal equipment and the changes in telegraph and telephone lines were designed and installed under the direction of the signal and telegraph departments respectively.

Surprise Tests on the New Haven

During the first six months of 1915 the New York, New Haven & Hartford Railroad made a total of 12,899 surprise tests covering signal observance by trainmen, and these developed a percentage of 99.75 that were perfect. In the period covered by the tests 31 per cent fewer employees were killed on the New Haven Railroad than in the corresponding six months of 1914, twenty-two employees losing their lives in the first six months of 1915, and thirty-two in the first six months

of 1914. No passenger was killed by train accidents on the New Haven Railroad during the period covered by the tests.

New Station at Eugene

Colonial Station Built by the Oregon Electric Railway at a Cost of \$50,000

The accompanying views show the interior and exterior of a new station recently completed at Eugene, Ore., on the line of the Oregon Electric Railway. This station is 122 miles from Portland, the northern terminal of the Oregon Electric Railway. Although the station is much more elaborate than would be found in the East in a



INTERIOR OF PASSENGER STATION AT EUGENE

city the size of Eugene, it is not greatly different in appointments to several other passenger stations on the line of the Oregon Electric Railway.

The building is of the Georgian Colonial type with red brick and stone trimming. The interior is a buff terracotta tone, the walls being finished in rough plaster. Quartered oak is used in the finishing, the walls being panelled. The general waiting room is 32 ft. x 56 ft.,



NEW STATION AT EUGENE, WITH TWO-CAR TRAIN

the baggage room is 28 ft. x 30 ft., and there is an express room 28 ft. x 28 ft. The floors of the main waiting room are of marble terrazzo.

A view of one of the limited electric trains on the Oregon Electric Railway, with a standard coach for the first car and an observation coach for the second car of a two-car train, is shown standing in front of the station.

Conference on Valuation

Delegates in Philadelphia in First Four Sessions Discuss Questions Dealing with the Reproduction Theory of Valuation, Original Cost as a Valuation Basis, Franchise Values and Land Values

The Conference on Valuation was held in Philadelphia, Pa., on Nov. 10, 11 and 12 under the auspices of The Utilities Bureau. Beginning with Wednesday evening, seven sessions were held, each one being devoted to some subject of particular importance in valuation work. These, in their successive order, were as follows: "The Reproduction Theory," "Original Cost," "Franchise Values," "Valuing Land," "Depreciation," "Going Value" and "Valuation and the Future of Public Utilities." The report below deals with only the early sessions, the others remaining to be covered in a later issue.

THE REPRODUCTION THEORY

The opening session of the conference on the reproduction theory of valuation was called on Wednesday evening with Hon. Rudolph Blankenburg, Mayor of Philadelphia, as presiding officer. The opening remarks were made by Morris L. Cooke, director of public works, Philadelphia, and acting director of The Utilities Bureau, who described the formation and development of this bureau and its intention to take up questions similar to that of valuation at future conferences. He further stated that nearly all discussions between cities and municipally-owned utilities on the one hand and privately-owned utilities on the other are of interest to a middle group. This group, however, does not consist of the actual investors in the private companies or their actual operators, but rather of those who market their securities. He believed that disputed questions can be settled harmoniously between investors and public interests without there being much at issue. These parties would probably select the amount of cash actually invested as the best criterion of fair value, but the other interests, unsatisfied with this basis, have stirred up much confusion on the subject.

MR. ESHLEMAN'S CRITICISM OF REPRODUCTION THEORY

After Mr. Cooke's remarks the first address on the reproduction theory of valuation was delivered by John M. Eshleman, Lieutenant-Governor of California and former president California Railroad Commission. Mr. Eshleman first discussed the term "threat price," or that price which is determined by the amount of the commodity possessed by the prospective purchaser and has no relation to the cost of production. In competitive industries the tendency to exact a threat price is regulated within reasonable bounds by actual or potential competition. All monopolies possess the power of imposing a threat price and of producing a threat value to the patron. As soon as it is admitted that public utilities or natural monopolies should not be destroyed as such monopolies, then it becomes necessary to devise a method of preventing them from imposing a threat value.

Mr. Eshleman then took a supposed valuation of a gas property and showed how every element of threat value that the monopoly character of the enterprise makes possible is included, and the reproduction value is based upon what it would cost another or the government agency itself to build a similar plant entirely independent of the need of such a duplicate plant. This, to his mind, forms the entire basis of the reproduction theory of valuation. Monopoly lawyers and engineers contend for a price based upon an analogy with condi-

tions existing under competition, and instead of measuring the price by what has been sacrificed or done, they want all that the public can be forced to give rather than build an alternative plant or induce a second utility to build such a plant. Mr. Eshleman believed that there are two absolute bars to such a theory. The one is the impossibility of imagining the monopoly never to have existed and the conditions which such monopoly has produced to be still there. The other is the impossibility of having the condition of the property of a monopoly affected by a duplicate competing agency and still remain unchanged.

As to particular phases of the reproduction method, Mr. Eshleman criticised the inconsistency of adopting the historical method with reference to some elements and rejecting it for others. He also deplored the logic of those who urge that original cost should always be used even in their reproduction theory when it would give more than present cost to reproduce, and at the same time repudiate costs of land and similar property when such costs are less than the present market value.

While opposed to the general reproduction theory, Mr. Eshleman stated that the historical method of reproduction is extremely valuable in supplying secondary evidence of original cost when the primary evidence is lost.

The proper amount upon which the utility should be permitted to earn in each case is an amount to be determined only by the governmental authority after consideration of all the facts, historical and otherwise, all the engineering and accounting data and everything to be learned about the utility. A general set of rules is impossible for existing enterprises, but in the future a liberal return upon the investment actually made would be all that is justified.

When government is dealing with monopoly it must of necessity deprive such monopoly of the power of taking all that it can get from its patrons. In this case the government must determine as a substitute what the monopoly ought to receive, and in this the safest and most just guide is what the agency has sacrificed and what service it has performed for the public. A different rule should obtain for the future than for the past. For the past there should be allowed such a valuation basis for earnings as equitable considerations warrant. The investor should receive that treatment which he has a right lawfully to expect and which, if possible of determination, accords the minimum return which would have induced the investment could it have been known in advance. For the future, according to Mr. Eshleman, an inducement which the investor is willing to accept must be held out as long as there is private ownership of utilities. The cost of doing the business plus a return upon the capital necessarily invested in the business, which return shall be as great as that offered in other businesses of similar hazard, is all that ought to be granted.

REPRODUCTION VALUE VERSUS FAIR VALUE

After Mr. Eshleman came H. Findlay French, attorney-at-law, Baltimore, Md., who gave an address on the relation of reproduction value and fair value. Mr. French mentioned that with the exception of a recent Maryland valuation covering only telephone instruments, no attempt has ever been made to estimate the

cost of putting in not a duplicate plant but a plant located along the most economic lines, taking into consideration every present condition. He alluded to this failure not by way of suggesting that true reproduction cost should consist of an estimate of the cost of the most efficient and economic plant which could be constructed under prevailing conditions, but rather to point out that the present method of arriving at reproduction cost results in a figure which is not value in the ordinary sense of the word.

Under the reproduction method as applied, the calculations are based upon the costs of labor and materials as they exist to-day. It is well known, Mr. French said, that those costs have been steadily rising for years, and that therefore the values obtained by this method are almost certain to be higher than the actual costs incurred by the public utility. This criticism is really one which, while it affects the public adversely at the present time, might easily be one that some time or other might return to plague the investor. It would not seem fair to the public utility, if cost of labor and supplies had gone down rapidly in the last ten years, to state arbitrarily that the value of its property devoted to public use had decreased in equal amount. It likewise does not seem fair to the public to raise the value of the public utility's property for the reason that costs have risen. To carry this plan to its logical conclusion, it would be necessary to change the value of the property of public utility companies each time that there was a fluctuation in the prices of labor and materials, and such a change would, of course, lead to unstable and undesirable conditions.

In Mr. French's opinion, however, the reproduction method has a true value in that it is of service in ascertaining the present value. In other words, the reproduction method is of service when reasonably applied in the valuation of most kinds of physical property, but it is of no real service in estimating the value of other classes of property, such as rights-of-way, developed business, etc., for the values arrived at by its use are based upon mere conjecture. To obtain the fair value of the property of a public utility company it is necessary to take every relevant fact into consideration, and reproduction value is only one and by no means the most important of the many relevant facts.

DISCUSSION OF REPRODUCTION THEORY

The foregoing addresses were followed by a discussion which was opened by Prof. Morris Knowles, director course in valuation of public utilities, University of Pittsburgh. Mr. Knowles felt that estimates of the cost of reproduction are useful only when carefully and honestly made. Instances of intended inflation of this figure, however, are rare, and he objected strongly to the suggestion that reproduction cost and the current methods of estimating it were invented by engineers for the purpose of maintaining high rates of utility companies. This is certainly quite as far from the truth as would be the statement that original cost was invented by municipal officials for the purpose of depriving utilities of a portion of their property. Furthermore, it is no better argument for the opponents of the utilities to say that cost of reproduction is wrong because it is higher than original cost, than it would be for the utilities to say that original cost is wrong because it is lower than cost of reproduction. The relation of reproduction cost to fair value, according to Mr. Knowles, may be considered from two different points of view, that of law and that of equity. From the point of view of existing law, the speaker believed that a perusal of court decisions can lead to no other conclusion than that the cost of reproduction is the most

important item of evidence in determining present value, and that upon it, with occasional modification, most of the decisions have actually been made. Such a conference as the present one, however, need not spend so much time in discussing the question from the point of view of law as from that of equity. It may well interest itself, not so much in what the law is as in what the law ought to be. There is a sense of compensation, of reciprocity, in the word "return" and in equity, when one speaks of a fair return, he means not a reasonable income upon some kind of valuation, but a giving-back to the investor a complete and fair equivalent for what he has devoted to the public service. Consequently, the amount upon which a utility is entitled to earn a fair return is the actual legitimate total investment in the property as determined by the total expenditures, not only in dollars and cents, but in time, energy, ingenuity and effort. Mr. Knowles believed that to the extent that the courts recognize cost of reproduction as the sole measure of fair value, they are in error and will eventually correct this by a reversal of position. Furthermore, the courts will be able to pierce through the fallacy that the basing of rates on actual original historical cost is a taking of property without due process of law.

A. B. Du Pont, consulting engineer, Cleveland, Ohio, was of the opinion that value varies directly in proportion to expected profits and inversely in proportion to risk. He said that for an appraiser to measure the value of a public utility property is for him to express at a given time what he believes to be the market price of the evidences of title to the property, and for an appraiser to measure the non-monopolistic value, he must express what he believes at a stated time would be the market price of the title if the profits and the certainty of the profits were not in any degree based upon monopoly.

Mr. Knowles then introduced several illustrations to show the difficulties of comparing two similar utilities on the basis of reproduction cost and summed up by saying that value is not dependent upon reproduction cost but upon the price of capital, the difference between expected earnings and expected expenses and the future activities of the utility within the limits expected to be imposed by government.

James E. Allison, consulting engineer, St. Louis, Mo., expressed the thought that it is not the business of commissions and other valuation bodies to find an existing value, for this they cannot do on account of their necessary regulation of rates. Their duty is to create a value that will be a just amount, based upon the exact sacrifice of the enterprise—in other words, the value that would have induced the creation of the utility. Then upon this value must be allowed a satisfactory rate of return.

The concluding remarks of the session were then made by Mr. Eshleman, who pointed out that "value" should be left out of the discussion, for what is being sought is simply an equitable amount that can be used as a basis upon which to allow earnings or to set a purchase price.

ORIGINAL COST

The session on Thursday morning was called to order with C. W. Kutz, chairman District of Columbia Public Utilities Commission, in the chair. Before introducing George W. Anderson, attorney-at-law, Boston, Mass., as the first speaker, Mr. Kutz described the beginnings of valuation work accomplished by his commission since a suitable appropriation was obtained a year and a half ago. Mr. Anderson then presented his address.

He discussed the question of how to get rid of the reproduction cost theory rather than the scheduled topic of actual cost as a basis for fair value.

GETTING RID OF REPRODUCTION COST THEORY

Mr. Anderson said that the reproduction cost theory is a menace to public safety, for it is not capable of sound and honest administration. He cited the case of the New York, New Haven & Hartford Railroad, in the case of which a reproduction value submitted to the validation board several years ago was widely understood to be a finding of the board itself and misled both stockholders and the public. He said that the reproduction cost theory originated with the courts. Rate-making power belongs solely to the legislatures, but the legislatures only half finished the job and the courts in taking over the legislative function made a bungle of the remainder of the program. The courts adopted the fair-value concept simply because the legislatures did not act, although the function of the courts is only to interfere to prevent confiscation. Mr. Anderson enumerated the only two things which to his mind are furnished by the private investor—*i.e.*, money and management, and the actual investment is in general all upon which the investor has a right to secure a return. For future cases the actual investment should be the criterion of valuation, while for existing properties the right to include land grants, etc., depends entirely upon specific factors in the company's history or any contract provision in its charter whereby the basing of a return solely upon the actual investment is prevented.

Mr. Anderson described how in Massachusetts, as a result of cases like that involving the Middlesex & Boston Street Railway, the capital honestly and prudently invested is treated as the controlling factor in the basis for fixing fair and reasonable rates. He noted that this practice has never been declared unconstitutional, and he predicted that if the question should come before the United States Supreme Court the validity of this theory would be upheld. In closing he advocated that national and state laws be passed requiring that rates be calculated on the basis of the actual capital furnished by the utility.

ORIGINAL COST AS CHIEF BASIS

Following the address of Mr. Anderson, Prof. Edward W. Bemis, of the Board of Supervising Engineers, Chicago, Ill., spoke on original cost as the chief basis for fair value. He defined original cost in the case of physical assets as the actual cost of the property now in use. In reproduction cost an attempt is made to determine the present-day costs of replacing the existing property, if it were suddenly removed or destroyed. In both cases, depreciation, or the estimated decline in units of service, should be considered. Estimates also are necessary, in both lines of investigation, but with the important difference that reproduction cost is all an estimate, based on current prices of labor and materials, while the original cost is only partly based on estimates, being obtained in large degree, and in some cases in almost its entirety, from the records of the company. The speaker said that the tendency to rely only upon reproduction cost has of late received many a deserved blow. Actual cost appeals to one's sense of justice and fair dealing and leads to security of investment, more than does the reproduction cost. How many investors who now champion the reproduction theory of valuation would adhere to it when it meant a rating down of their original investment by a decline in price levels? The oldest of the state commissions, the Massachusetts Gas & Electric Light Commission, has always sought to base a fair value or rates on capitalization, and capitalization on

that part only of the cost that has been borne by direct contributions of the stockholders and bondholders. Professor Bemis did not discuss the propriety of this further step, successfully maintained in the recent Haverhill gas case, but mentioned it only as it is based on the acceptance of original cost as all-important.

DISCUSSION ON ORIGINAL COST

The discussion on the preceding addresses was opened by Robert H. Whitten, secretary Board of Estimate & Apportionment committee on the city plan, New York City. Mr. Whitten thought that the subject of valuation should be discussed from the point of view of the proper theory rather than that of existing law. He believed that under regulation the reasonable rate is that fixed by the normal cost of production, which is itself determined by the normal cost of labor and materials, the proper amount of depreciation and a fair return on the capital cost. The normal capital cost is difficult of determination as to whether it depends on actual cost or reproduction cost. As a general proposition, however, the public is entitled to a cost that is based on the reproduction of the service rather than of the identical plant. Yet because of the difficulties involved in creating a modern and improved design capable of giving the same service, the reproduction theory in practice has deteriorated to involve the reproduction of an identical plant. After discussing how the fair rate of return may be varied from year to year to offset appreciation or depreciation in reproduction cost, Mr. Whitten finally stated that any basis fair to all parties must sooner or later get back to actual capital cost. Utility service is continuous, and present cost is as much a result of past life as of present conditions. Normal actual cost has one advantage from the public point of view in that it does not involve fluctuations in cost, and no utility should be expected to assume the risks of speculation in land, materials and the like.

Edward P. Burch, consulting engineer, Detroit, Mich., stated that engineers were inclined to use an ethical basis in judging inventory items. If a railway actually paid for the paving between its tracks, the cost should be allowed but not otherwise. Attorneys, he felt, were less inclined to consider inventory items on the ground of equity and actual sacrifice. In regard to original cost, however, Mr. Burch was of the opinion that this can seldom be known and must be determined from secondary evidence secured by the reproduction method. Yet so far as the cost can be based upon the actual sacrifice of the investor, one important factor not complicated with hazy intangibles is obtained for a rate basis.

In reply to a question by Prof. John H. Gray of the University of Minnesota, Mr. Anderson stated that so far as he recalled there was nothing in the recent Fall River gas decision that would affect the ultimate upholding of the Massachusetts theory by the highest court. F. W. Stevens, general valuation counsel New York Central Lines, remarked that he had nothing to withdraw from his various attacks on the reproduction theory while on the Public Service Commission for the Second District of New York, but he never had been and is not now in favor of the unqualified statement that rates should be based on original cost. He did not believe that such a method is workable or just in a large number of cases, although in some cases it is absolutely right. The weakness of the whole discussion seemed to him to be the assumption that rates should be based on ethical theory, for no agreement can be reached as to what constitutes an ethical basis in spite of the correctness of such a basis.

Frederic P. Stearns, consulting engineer, Boston, Mass., heartily agreed with the idea that actual cost

should be the basis for the future and he supported the plea for legislation to permit the use of this basis. For old properties it may not be possible or just to use the cost basis on account of equities that may have developed. Reproduction under present conditions, however, brings in irrational ideas, and Mr. Stearns saw no reason why the necessary reproduction should not be carried on according to the way in which the utility was actually produced. Every effort and element appearing in the course of development should be included in the reproduction total, except property never created by the utility. The requirements of ethics can be maintained by using original conditions in determining the reproduction cost of both physical property and overhead charges.

INVENTORIES

The subject of the making and maintenance of priced inventories was then taken up by Charles L. Pillsbury, chief engineer valuation bureau, District of Columbia Public Utilities Commission.

Mr. Pillsbury said that the inventory of physical items should be a matter of fact, not of controversy, and disputes should be settled in the field and not in court. Inventories can be maintained to advantage by the operating companies. The public will pay the cost in any case as the inventory maintenance will become an operating cost. A permanent valuation staff should be organized within the company, and the maintenance of the inventory will become a much more simple task than is generally assumed. A large proportion of the requisite data can be obtained almost automatically and with moderate extra labor. Inventory maintenance in this manner would result in highly desirable standardization of purchasing and construction methods and cost keeping.

Mr. Pillsbury's paper was discussed by James W. Phillips, of the grade crossing division Bureau of Survey, Philadelphia, Pa.; F. W. Ballard, commissioner and chief engineer Division of Light & Heat, Cleveland, Ohio, and R. J. Meigs, valuation engineer Western Union Telegraph Company, New York. Mr. Phillips spoke of the importance of having a proper inventory and the great care that should be taken in its formation and maintenance. He believed that the inventory should have the same general foundation regardless of the expected use. Mr. Ballard said that the reproduction cost is the basis of financial valuation and that even when available original cost is of far less value than reproduction cost. Mr. Meigs was of the opinion that the future use of the inventory data should be taken into consideration in making the inventory. He emphasized the importance of co-operation between commissions and utilities in making inventory investigations and said that the lack of a uniform method, a uniform understanding and general broadmindedness were adverse influences in inventory work that should be overcome.

FRANCHISE VALUES

The presiding officer at the Thursday afternoon session was L. S. Rowe, president American Academy of Political & Social Science. Before the main topic of the session, franchise values, was taken up, a paper by John G. Morse, appraiser Associated Factory Mutual Fire Insurance Companies, Boston, Mass., on the subject of valuation by approximation was read and discussed.

VALUATION BY APPROXIMATION

Mr. Morse described the methods of his organization whereby an accurate appraisal of manufacturing property for insurance purposes is made in a few days of actual field work and a few more of office work. He

asserted that it is useless to waste time on minor detail in appraisal work when a large proportion of such work must of necessity be based on estimate. In cases where his organization had the time to make an examination of the usual detailed appraisal it always found the usual proportion based on estimate only and errors large enough to counterbalance the value of whole pages of minor items so laboriously collected. These errors do not materially affect the final result, as the law of averages takes care of that, but the same law of averages applies to the shorter or approximation method and the final figure obtained by the detailed method is no more accurate than that made by the shorter method.

In answer to the assertion that the courts will not recognize an appraisal unless made in fine detail, Mr. Morse said that it would take very little effort to demonstrate to any court how largely estimate enters into any appraisal and that an appraisal made on broad common sense lines can be just as accurate as one made in great detail.

The advantages of valuation by approximation were discussed by Mr. Cooke and W. N. Polakov, consulting engineer, Stamford, Conn. The plan of making inventories in minute detail possessed little value according to Mr. Cooke, who cited the case of the inventory made by the Philadelphia Electric Company at an approximate cost of \$200,000. This might have been cut to one-fifth that amount had valuation by approximation been used. He maintained that manufacturing and industrial establishments underestimate the value of inventories, whereas public utility companies lay entirely too much stress on valuations. Moreover, he contended that public utility valuations are not made with a view to ascertaining the cost of service but solely for financial reasons.

The necessity for minuteness of inventories, Mr. Polakov thought, was not nearly so important as care in operation. In the New Haven power plants he was able to cut operating expenses 25 per cent without adding a cent to the investment by merely changing the methods of operation. It was pointed out by Mr. Stevens, however, that minuteness in inventory is a necessity in many cases. In a case in which he is interested the addition of just 1 cent to the value of a railroad tie would increase the value of that one item by \$500,000. His experience when a member of the Public Service Commission for the Second District of New York, indicated to him that when utilities are treated no better or no worse than a manufacturing company, they do not complain of unfairness. Railroad men, he said, do not look with apprehension on the present valuations because of rate considerations, but because of the possible effect such valuations may have on the credit of the railroads in securing the millions needed for improvements.

DR. WILCOX ON FRANCHISE VALUES

The first address on the subject of "Franchise Values" was by Delos F. Wilcox, deputy commissioner Department of Water Supply, Gas & Electricity, New York City, and consulting franchise and public utility expert. Dr. Wilcox took up the various principles of franchise values as concerned in valuations for the purpose of (1) taxation, (2) rate-making, (3) condemnation (4) involuntary sale, (5) voluntary purchase, and (6) capitalization. In connection with the first point he stated that it is admissible to tax franchise values without reference to the possibility of their being reduced or destroyed in the future by any means. The value for such taxation purposes is to be determined primarily by the capitalization of the net earning power of the fran-

chise after the deduction of a fair minimum return upon the physical property. The duration of the franchise and the fixity of rates are important indirectly as they affect the security of the property or its earning power and thus increase or decrease the fair rate of return.

In relation to franchise values in rate-making cases, Dr. Wilcox said that the valuation in a tax case has no significance. He cited the Passaic Gas case and the final reversal granting no separate allowance for franchise value, and said that it is reasonably well-settled that no separate and distinct value need be assigned to franchises except in peculiar cases where these values have been measured and capitalized by authority of the State itself. Moreover, where franchise value is allowed for an original compensation paid for the instrument, it must be based on actual cost or assumed actual cost, without depreciation where the franchise is perpetual and with proportionate depreciation where its life is limited.

In condemnation proceedings the present worth of the prospective earning power, based on fair and reasonable future rates, is the real criterion. Fixed rates are an important consideration, but it must be remembered that in some cases they may prove disadvantageous to the corporation. Public regulation with its requirements results in a tendency toward conservative franchise valuations. The chief value of a perpetual franchise consists of the life and security it gives the physical property, and any attempt to measure its separate value is almost certain to lead to over-valuation, for the future net earnings are likely to be less than any definite estimate on the basis of past figures. This is caused partly by past neglect of depreciation and partly by the constantly increasing expenditures resulting from higher standards of service and greater interferences with operation. As regards limited franchises, these are undesirable to both grantor and grantee, which fact should receive major consideration in valuing them. If the full going value of the physical property without amortization charges is allowed, the value of the franchise should be greatly reduced. If, on the other hand, the franchise is allowed at its full value on the basis of its earning power in excess of a fair return without amortization charges, the present value of the physical property should be considered in the light of the fact that it will have only scrap value at the expiration of the grant. This suggestion, Dr. Wilcox admitted, is revolutionary, and probably a fair valuation would be derived by a method half-way between this and the usual one of basing the valuation upon the expected net earnings above a fair return.

In involuntary sales, or sales enforced in accordance with franchise or contract terms at the option of the city, it is not unusually provided that the property be taken over without franchise value being considered. Even if this agreement is extorted as a condition of securing the franchise, the utility is not entitled to any additional franchise allowance because the property is involuntarily surrendered. Franchise values in cases of voluntary purchase are matters of bargaining. Such values most frequently appear in resettlement cases, where the determination of a future purchase price is a primary factor and the city for certain considerations of fares or service agrees to capitalize the prospective earnings under the unexpired franchise on the old basis. As for capitalization cases, no franchise should be capitalized except to the extent of the necessary original cost to the grantees in the form of lump-sum payments to the public authorities. Annual fees should be treated as operating expenses. In closing Dr. Wilcox mentioned "fag-end" franchise, or franchises covering different routes and expiring at different times, and stated that the valuation of these should be made on

the basis of their value to the owner as complete independent operating rights. If they have no value except in connection with other rights that do not exist, no value should be assigned.

DISCUSSION ON FRANCHISE VALUES

H. DeF. Baldwin, president and counsel Queens County Water Company, New York; C. A. McLain, lecturer Harvard University, and A. Bettman, attorney-at-law, Cincinnati, Ohio, dwelt on certain legal phases of the question of franchise values. Mr. Baldwin admitted that net earnings were an important element in arriving at the value of a franchise, but that the bare permission to use the streets did not enhance the value of a franchise in the case of a company skillfully managed and thereby enabled to show fair profits. In such a case the going value of the concern was enhanced and not the franchise. No other property is appraised as are public utilities, and a frank recognition of the fact that capital has to be paid for should be evidenced in the allowance made for going value. He did not agree with Mr. Wilcox that reductions in rates give stability to a franchise and claimed that the security of the franchise depended on the ethical standards of the community.

Mr. McLain discussed the legal and administrative aspects of the problem. He said a franchise was a privilege, and all privileges may be taxed. His discussion had to do chiefly with the strictly legal side of the definition and limitation of a franchise and of the rights of the public and of the investors. A franchise, he said, was not an element for rate purposes. Mr. Bettman claimed that only for determining compensation in condemnation proceedings did a franchise possess a value. In all other cases its function is to protect, but beyond that it is valueless. The theory of condemnation proceedings should be that the franchise is simply revoked on payment of a sum sufficient to protect the investors who relied on the continuance of the franchise.

VALUING LAND

The session on Thursday evening, on the subject of land values in valuation work, was presided over by Charles F. Jenkins, proprietor *Farm Journal*, Philadelphia. The order of business covered an address by Hammond V. Hayes, consulting engineer, Boston, Mass., on the subject of the principles to be applied in such work, and discussion thereon.

PRINCIPLES TO BE APPLIED IN VALUING LAND

Mr. Hayes said that before any question of the value of land can be considered, two figures must be found, one representing the original cost of the land and the other what it would cost to obtain the land now in use and useful, if held in private ownership and acquired by the railroad company at the time of the appraisal. This last figure is the cost of reproduction. An analysis of both the original cost and the cost of reproduction shows that each may be divided into two parts, (1) the figure which would be assigned in condemnation proceedings as the price which a company should pay for the land acquired by it, and (2) the costs of condemnation, of damages, and of purchase.

The method which should be employed in ascertaining the first portion of both the original and the reproduction cost is that in which the normal market value is ascertained of adjacent similar lands as revealed by the prices paid in voluntary private sales, both at the time of the original acquisition of the lands by the company and at the time of the appraisal. The normal sales value of adjacent similar property should be found not for the time of the appraisal alone but as of the date

of the original acquisition of the land under valuation. Moreover, each parcel of land—a parcel being defined as a separate and distinct purchase—should be associated with similar adjacent lands of which the past and present market value can be ascertained. In addition to the two normal basic figures thus found, the amount paid to the original owner of each particular parcel should be found and entered against that parcel. By this method the price paid by the company and the normal market value at the time of purchase is shown for each particular parcel, and there is revealed the difference between the cost to a company of its land and the amount which was paid at that time in voluntary normal sales of similar land. Thus a ratio is established by the use of which the reproduction cost may be found from the normal market value of similar and adjacent land at the time of the appraisal.

The figures obtained through the use of this method, according to Mr. Hayes, give the original cost and, for the reproduction cost, the price which a company has paid and in all reasonable probability would have to pay at the present time for the land now used for the benefit of the public. The fair present value, however, is not the reproduction cost necessarily or the original cost. If the normal market price of the land is increased by a well established multiplier the reproduction cost of the land thus found would be large, but it would show with all reasonable accuracy what it would cost to reproduce the land at the date of the appraisal, and it would give a measure of a maximum beyond which no reasonable claim for a fair rate base could be made. On the other hand, the original cost less depreciation is, in the majority of cases, the minimum cost. Between these two costs, concluded Mr. Hayes, the fair value must be assigned with fair and impartial judgment in the light of all other relevant facts and figures.

DISCUSSION ON LAND VALUATION

In discussing Mr. Hayes' address A. E. Helm, commerce counsel Kansas Public Utilities Commission, advocated strongly the theory that public utilities are really public property, and the stockholders are only the managers. For these reasons the public cannot allow any private speculation in land values, and the unearned increment becomes a negligible factor. Mr. Eshleman opposed the agency theory. In California the courts have decided that no class of companies can be made utilities and forced into public use unless the companies voluntarily acquiesce. He thought that the unearned increment as an element of value in the case of railroads was decreased in importance because these carriers enjoy their right-of-way on the express condition that it be devoted to only railroad use. Under such a condition the property is less valuable than that which may be used in any way. Mr. Stevens brought out the point that under the agency theory the public assumes all of the benefits and none of the risks. He stated that the court conception of value is now what it has always been—present market value. He mentioned the criticism that some railroad property was wrongfully acquired, but he insisted that by digging into the past the public did not restore such property to the original owners, but only wanted to acquire itself what it had never paid for.

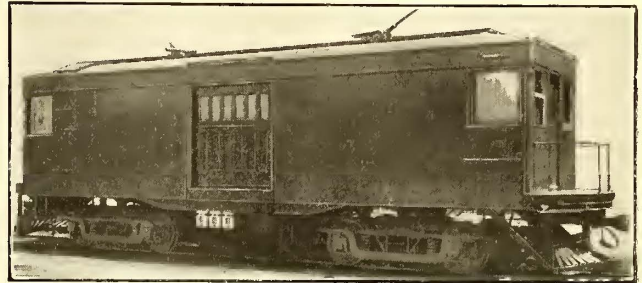
Milo R. Maltbie, member of the advisory board division of valuation, Interstate Commerce Commission, next advocated the inclusion of appreciation of land values as an item of income to be credited as such, on the same theory that depreciation is allowed as a charge to operating expenses. A. Sapolski, member of valuation board, Delaware & Hudson Railroad, Albany, N. Y., objected to Mr. Maltbie's theory from the accounting point of view, for the appreciation as income would

not be supported by any cash or other negotiable asset.

The session on Thursday evening then concluded. A report of the meetings on Friday, Nov. 12, will be published next week.

Express Car for Coffeyville, Kan.

Several unique features worthy of mention were embodied in the new locomotive-express car recently put in operation by the Union Traction Company of Coffeyville, Kan. This car is 40 ft. long over all and is of semi-steel construction with an arched roof. The underframe is built with center and intermediate sills formed of 8-in. 25½-lb. I-beams which extend continuous from bumper to bumper. The side sills are 8-in. 25½-lb. channels also extending the full length of the body, but reinforced under the wide center-door openings. The center sill is also reinforced at the center of the car by an additional 8-in. 25½-lb. I-beam which extends as far each way from the center of the body as truck clear-



COFFEYVILLE (KAN.) EXPRESS CAR

ances will permit. Features in the design of this car are corner windows, which slide toward the center of the car, and two drop sash openings, one on each side of the center and end doors. In plan the car body is rectangular but the underframe extends beyond the car ends forming semicircular exposed platforms. These platforms are provided with hand rails and, together with the window arrangement, have been found very convenient in switching and road service. The motorman's stand at each end of the car is surrounded by a 1¼-in. wrought-iron pipe bulkhead equipped with a motorman's curtain. This car body is mounted on St. Louis Car Company's No. 61 high-speed interurban trucks, equipped with 33-in. M. C. B. wheels with a 7-ft. wheelbase. The electrical equipment includes Westinghouse 306-volt motors. This car was built complete by the St. Louis Car Company, St. Louis, Mo.

Measuring Specific Resistance of Earth

The Bureau of Standards has just reprinted from the Bulletin scientific paper No. 258. The paper explains a method for measuring earth resistivity without disturbing the soil, which has been used by investigators of the bureau. It consists in inserting four electrodes in a line in the soil, sending alternating current between the outermost two of these and making measurements of the electrical conditions between the other two by means of a bridge arrangement. In the nature of the case the measurement is not a simple one in theory, but would appear not to be extremely difficult in practice.

In the article on "Seven Years of Operating Experience of a Single-Phase Interurban Railway" printed in the issue of Nov. 6, the captions of the two tables appearing at the top of page 943 were inadvertently transposed. As was explained clearly in the article, there was a very great reduction in train delays in 1915 as compared with 1912.

American Association News

Biographical Sketches of New Officers of Washington Company Section—Details of the Two Week's Conference on the National Safety Code in New York—Notes on Engineering Association Committee Meetings

NEW WASHINGTON SECTION OFFICERS

As already announced, at the recent election C. S. Kimball was selected as president of the Washington Railway & Electric Company section and R. A. Vetter, secretary. Mr. Kimball has been in electric railway work since he was fifteen years of age, and is widely known in engineering and railway circles. He is a charter member and was an incorporator of the Washington Society of Engineers and is a member of the American Society of Civil Engineers. He is also a member of the executive committee of the American Electric Railway Engineering Association, and has served on its committee on way matters for the last five years, having been chairman of the way committee for two years.

Mr. Kimball was born in Dubuque, Iowa, in 1879, and was educated in the public schools in New York City. He started practical work in the engineering department of the Metropolitan Street Railway under the late



C. S. KIMBALL

President
Washington Company Section



R. A. VETTER

Secretary
Washington Company Section

F. S. Pearson. While at work he kept up his studies in the science of engineering. After six years with this company he joined the engineering staff of William Wharton, Jr., & Company as designer and computer of special track work layout, leaving this firm to join the staff of John Van Vleck, who was engaged on the design of structural steel for the Rapid Transit Subway Construction Company. In 1902 he returned to the Metropolitan Street Railway as assistant engineer, leaving a year later to enter the bridge department of Westinghouse, Church, Kerr & Company, which was at that time designing the Pennsylvania Railroad station in New York. Since 1904 Mr. Kimball has been with his present employer as engineer of way and structure. He has charge of all construction, maintenance and building work, including overhead and underground trolley systems aggregating in excess of 163 miles of track.

Mr. Vetter is a much younger man, having been with the company but four years after serving elsewhere in one or two capacities of lesser importance. He hails from Ohio. After an elementary training in public and private schools he studied in Mt. Union College and Georgetown University, from the latter receiving the degree of Bachelor of Laws. Since entering the service of the company he has been the round of the managing,

accounting and treasury departments, being at present connected with the legal department, the work of which includes the handling of claims.

SAFETY CODE MEETING

A preliminary note on the New York conference on the proposed national electrical safety code was printed in the issue for Nov. 6, page 953. At this conference the American Association was represented by the following delegation: W. J. Harvie, Syracuse, N. Y., chairman; C. L. Cadle, Rochester, N. Y., and B. F. Wood, New York, N. Y., and A. S. Davis, New Haven, Conn., alternates. These men were members of the sub-committees on lines, stations, operation and utilization respectively.

Each day's sessions of the two weeks' conference consisted of general morning meetings and afternoon and evening sub-committee meetings. As the work of the sub-committees progressed the revisions developed were referred to the general conference for approval. At the sessions the code was read rule by rule, and the results of the application of each were considered and numerous revisions were adopted.

Each of the members in attendance upon the conference and others who have presented suggestions to the committee will receive the complete revision as made at the New York Conference, in memorandum form, in order that they may have an opportunity to review the proposed code as it now stands. In addition to this, each member company of the American Electric Railway Association will receive through the secretary a copy of the memorandum code, with a request that the code be immediately studied with a view to its application on each individual property. Suggestions which these companies desire to make will be received at the secretary's office and forwarded to the committee for consideration. It is probable that the rules will shortly be recommended by the Bureau of Standards to the various regulatory and administrative bodies for trial use during a period of approximately a year, prior to their promulgation for definite and final adoption.

ENGINEERING ASSOCIATION COMMITTEE MEETINGS

A meeting of the Engineering Association committee on subjects was held in New York on Nov. 11 to plan the work for the year. In attendance were J. H. Hanna, Washington, D. C., and Martin Schreiber, Newark, N. J.

The executive committee met on Nov. 12 with the following members in attendance: John Lindall, Boston, Mass., president; W. G. Gove, Brooklyn, N. Y., third vice-president; J. H. Hanna, past-president, Washington, D. C.; C. S. Kimball, Washington, D. C.; C. L. Cadle, Rochester, N. Y.; C. F. Bedwell, Newark, N. J., and E. B. Burritt, secretary, New York, N. Y. E. R. Hill, New York, was represented by S. A. Spalding. The committee is in session as this issue goes to press, but it has already completed the subjects assignments for the committees and these will be announced as soon as the committees have been duly notified.

The subject and executive committees of the Transportation & Traffic Associations will meet in New York on Nov. 18 and 19 respectively.

Equipment and Its Maintenance

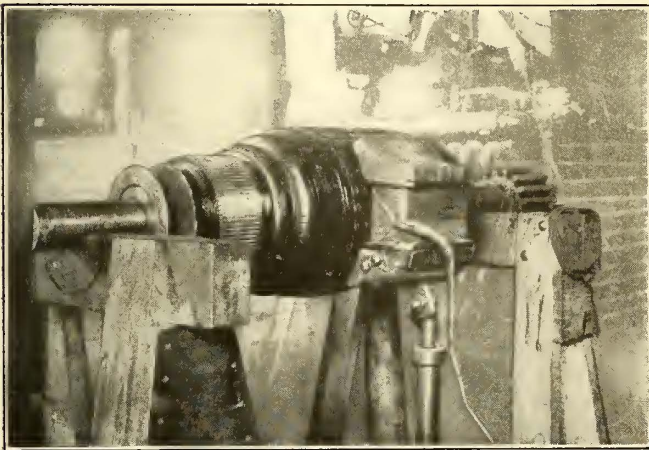
Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

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

Where a Single Winder Maintains 951 Motors

BY JOHN SUTHERLAND, MASTER MECHANIC TRI-CITY RAILWAY & LIGHT COMPANY, DAVENPORT, IOWA

When a single winder can maintain, without difficulty, 951 motors averaging 4000 miles a month, it is evident that the system of inspection must be right or this enviable record could not be obtained. This result is attributed to recent improvements in the system of inspection and repairs effected by the mechanical department of this company. In 1913, with 667 motors in



TRI-CITY RAILWAY'S MOTOR-REPAIR METHODS—YOKE FOR POTENTIAL TEST

service, 306 motor-defect cards were turned in, of which eleven were for poled motors, the remainder for minor defects, many of which should properly have been charged to other parts of the equipment. Two winders were required at that time in the motor-repair department, whereas in 1914 only eighty-four motor-defect cards were turned in with 793 motors in service, and one winder had no difficulty in maintaining all the motor equipment in the service at a high standard. In addition to the 793 railway motors, this winder also maintained 158 compressors and did some outside work for the lighting and power department. This winder, an experienced man at this work, received 37½ cents an hour and, charging his entire yearly wage to railway motor work, the annual cost of winding per motor was \$1.16. This is an exceptionally low figure, particularly when it is considered that the motor equipment included eight different types, seven General Electric and one Westinghouse.

The success which has attended motor maintenance methods on the Tri-City Railway is largely attributed to the methods of testing for electrical weaknesses and of keeping up the bearings, coupled with minor changes in the quality of material used in making repairs. All motors, regardless of their condition as revealed by inspection, are carefully tested before and after repairs. Whenever a truck is brought into the shop for wheel

changes the motors are removed and also submitted to a potential and current test. The mechanical department is satisfied that the current test is more important than the potential test. First-quality material, combined with experienced workmanship, is considered a strong safeguard against weak insulation. As a check on the condition of the insulation, however, it receives a 110-volt a.c. test with a load of 30 amp. This potential test is made with the usual yoke mounted on a portable stand, which is shown in one of the accompanying illustrations.

Two different current tests are employed, depending upon the judgment of the winder as to the necessity for them. In the test generally employed the motor is mounted in the truck, the wheels are blocked with wedges and the motor leads are connected temporarily to a rheostat, after which the wheels are spun. In case this is deemed insufficient to develop all defective conditions the trucks are placed under a car in which position the repaired motor is required to move the car. Either of these energy tests will indicate weak solder joints or open circuits between the commutator and the winding. The excessive energy flow resulting from spinning the wheels is also considered an additional check on the condition of the insulation. Aside from the test value of spinning a motor under a car, the mechanical department knows that, in case of trouble, any car on the system may be brought into the shop with one motor.

In no case is the card report of the inspector taken as final. All armatures and fields are thoroughly inspected and tested whenever they are brought into the shop, which insures the electrical and mechanical condition of all motors when they are returned to service. The fields are also carefully examined and tested with a Century testing outfit. In many cases it is found that the field-coil cushions which were fitted when the motor was new no longer hold the fields secure. This is due to shrinkage both in the cushions and in the coils, and

TRI-CITY RAILWAY COMPANY																											
INDIVIDUAL ARMATURE RECORD																											
Original Armature No. _____ Type _____																											
Changed to No. _____																											
Date In.	Date Out.	Car No.	From Car No.	Truck Changed	To Car No.	Date Charged	Wound	Coil In	Coil Reamed	Open Circuit Blk'd	New Commutator	Commutator Block	Micro Brush Reqd	Correcting	Shims	Re-Head.	New Head.	Bushings	Commutator Trimmed	Shaft Straightened	Regard Shift.	New Shift.	Miscellaneous Repairs	Cost of Labor on Repair	Mileage		

TRI-CITY RAILWAY'S MOTOR REPAIR METHODS—PERMANENT ARMATURE RECORD FORM

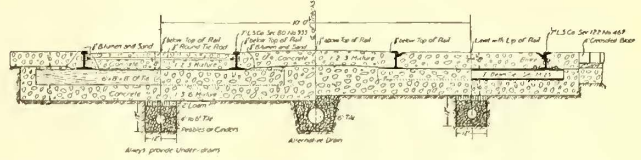
the condition is relieved by supplying as many additional cushions as may be required to restore the coil to the correct position. These cushions are made of scrap Pantasote or canvas, cut to the same form as the field coils, and two or three thicknesses of this material are sewed together for one cushion. To preserve them, the cushions are dipped in linseed oil and permitted to drain

Owing to the monolithic character of concrete pavement, careful attention must be given to track design so that the necessity for frequently tearing up tracks will be eliminated. Efficiency of concrete paving between car tracks, therefore, depends greatly upon developing and using a type of track construction that will insure that the rails and other track fittings will endure as long as the pavement itself. Steel as well as wood ties, entirely embedded in concrete, have been used, and time has proved that both properly embedded in well-made concrete are protected from decay and corrosion, hence will certainly last as long as the pavement. Repairs to street railway tracks consist largely of rail joint maintenance. Unless a welded or riveted joint is used, no present-day type of rail connection escapes the necessity for occasional maintenance.

In most cities where concrete has been used for paving between the tracks the material has been placed in practically the same manner as when paving the remainder of the street. Only granite and trap rock should receive consideration as coarse aggregate for concrete pavements in the track space. As vehicular traffic largely follows the tracks, especially in winter when the railways have swept away the snow, shock and abrasion are more extensive on this portion of the paved area than on the remainder of the street. If either granite or trap rock is used the pavement surface exposed to wear offers resistance to abrasion equal, in a properly proportioned and graded mixture, to that afforded by granite block pavement. When the film of mortar that is flushed to the surface by floating the concrete has worn off as a result of traffic abrasion, a properly constructed pavement will present the appearance of a mosaic in which the units consist of granite chips varying in size from 1/4 in. to 1 1/2 in.

As the street section occupied by car tracks often receives more than its share of heavy vehicle traffic, wear along the rails is excessive. Heretofore the practice has been to lay stone block beside the rail, but where the amount of traffic is not great concrete can be laid directly against the rail. Two methods of construction have been followed when concrete is used. In some cases a construction joint is placed parallel to the rail and directly over the ends of the ties, and in other cases the concrete is laid from the rail to the curb in an unbroken stretch. When a joint along the track strip is contemplated the form is set and the concrete deposited for the street pavement between this form and the curb. After this strip is hard the form is re-

moved and the space between it and the outside of the rail is concreted, leaving nothing between the two stretches of concrete except the construction joint at the ends of the ties. Whether a joint running at right angles with the ends of the ties is used or not, is very much a matter of personal choice. If used, there is no necessity for cutting the street pavement proper when renewing rails or repairing tracks. If the street pavement proper is laid directly against the rails, the track must be very carefully constructed, otherwise if there is settlement or movement, the pavement usually cracks. Rail wear on curves is more rapid than on straight track, hence rail renewals are more frequent, and it

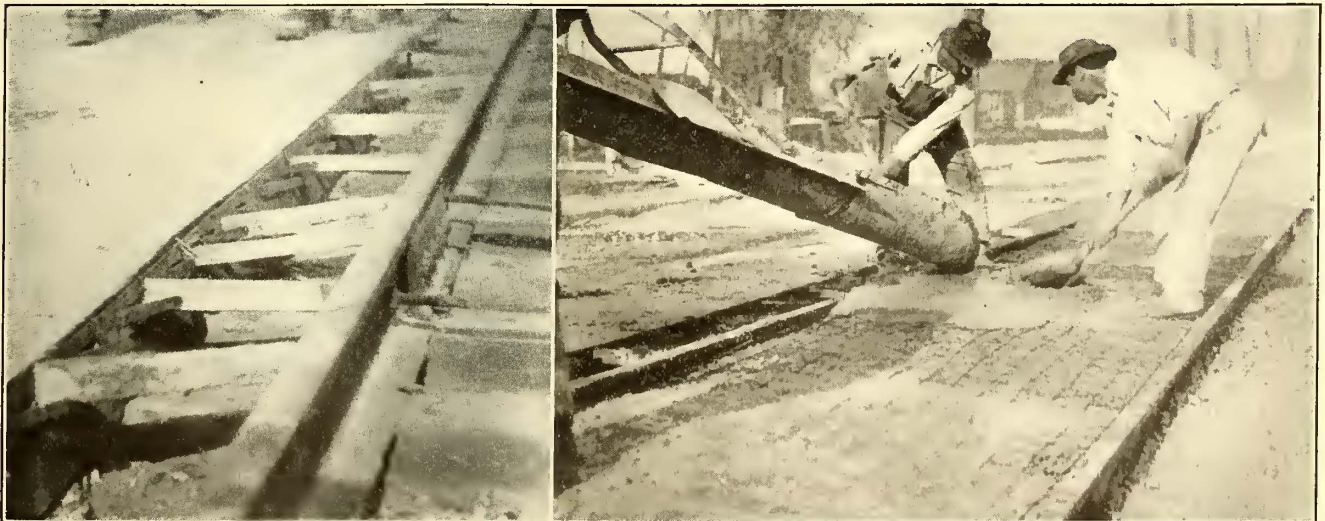


CONCRETE PAVEMENT—DESIGN FOR CONCRETE PAVEMENT BETWEEN STREET RAILWAY CAR TRACKS

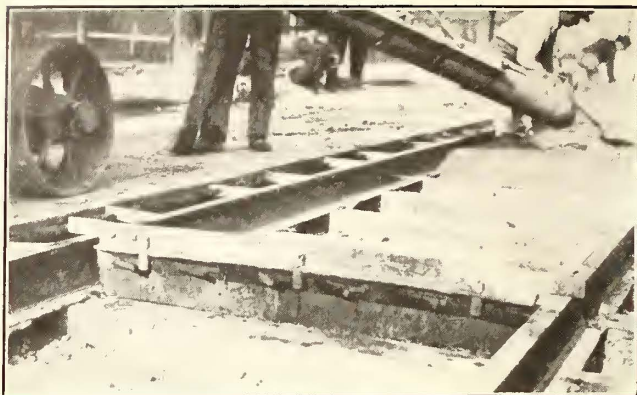
is generally considered advisable to place a construction joint at the ends of ties on curves even though such practice is not followed on tangents.

When concrete is used for the entire pavement between rails, provision must be made for car-wheel flange clearance where the ordinary type of T-rail is used. In such cases the concrete flangeway is generally made 1 in. to 1 1/4 in. below the rail top. Investigation has disclosed that there is a strong tendency in present-day practice to form a deep groove for wheel-flange clearance. When the usual horse-drawn vehicle follows the line of rails, a detrimental prying action is exerted particularly when the wheels turn out of this groove, often resulting in chipping the pavement. To overcome this action a gradual crown can be obtained by using a strikeboard or template which is rested on the rails when striking of the concrete. Such a crown also provides drainage for the space between rails.

Generally speaking, the crown in the devil strip between tracks should start at the rail 1/4 in. below the top and continue as a circular curve to the center line of the strip. The 1/4-in. clearance at the rail will allow for false flanges which otherwise cause the formation of a chamfer varying from 1/2 in. to 2 in. wide by 1/2 in. deep when the concrete is finished off flush with the



CONCRETE PAVEMENT—BLOCKING OF JOINT PROTECTION PLATE IN POSITION PREPARATORY TO CONCRETING OUTSIDE OF OUTER RAIL; SPOUTING WEARING COURSE OVER MESH REINFORCEMENT LAID ON LOWER COURSE



CONCRETE PAVEMENT—JOINT PROTECTION SET
IN PLACE

rail top. As the car wheel tread is always equal to and usually greater than the width of rail head, any false flange wear will extend beyond the outside of the rail. Often wear in the wheels forms a slight flange on the tread, thus causing the outer portion of the tread to come in contact with the pavement surface unless the $\frac{1}{4}$ -in. clearance is provided.

When concrete pavement is used in the track allowance rail braces instead of tie rods seem preferable, as the tie rods tend to decrease the net section of concrete. If tie rods are used, however, those having a circular cross-section are preferable to the rectangular type now common in track construction where block pavement is used.

Owing to the severe shock due to the diversion of traffic near switch and frog points, extreme care should be exercised in the concrete construction at these points. Perfect bond between rails and pavement can be secured if the pavement is properly and sufficiently protected while hardening. For this reason special care should be taken to practise the best curing methods and close the paved portion to traffic while the pavement is acquiring strength.

In the fall of 1914 there was constructed in the village of Lyons, Ill., about 8500 sq. yd. of concrete pavement. About 4450 ft. of this pavement included two car tracks with a devil strip and a 12-in. strip of concrete outside of the outer rails. The pavement was 11 in. thick between rails and 7 in. thick between tracks. Two-course construction was followed, the top or wearing course being 2 in. thick, calling for one part Portland cement and two parts aggregate, the latter consisting of two parts sand and three parts of granite chips ranging from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. in size. The base consisted of a 1:2 $\frac{1}{2}$:5 mixture in which a clean, hard, crushed limestone ranging from $\frac{1}{4}$ in. to 1 $\frac{1}{2}$ in. in size



CONCRETE PAVEMENT—COMPLETED STRETCH OF
CONCRETED TRACK

formed the coarse aggregate. A machine mixer delivering concrete by means of a spout was used on this work. Crown between rails and in the devil strip was obtained by the use of a template resting on the rails while striking off the concrete, and wooden hand floats were used for finishing.

Transverse joints 50 ft. apart were installed by using Baker plates and $\frac{3}{8}$ -in. Carey Elastite. Several views of this work in progress are shown in the accompanying illustrations. An inspection of this work showed that many of these joints were low and uneven, which probably was a result of neglect properly to adjust the plates in the installing device and to finish even with the top of the plates. Finishing with a split hand float would have in part compensated for this. A longitudinal joint was placed at the tie ends and formed by two Baker plates, one was placed in the street pavement when it was laid and the other was placed with the 12-in. strip along the rails. Between these two plates a $\frac{3}{8}$ -in. Elastite expansion joint was installed. As the plate in the street pavement proper was sometimes placed too low and again too high, the contractor found it impossible to finish a neat joint. The only method of holding the inner plate up to the plate in the street pavement proper and against it was by braces set between rails and plate. This often required such a firm setting of braces that the track was thrown out of line. If any defects occur in this track construction later they are likely to consist of transverse cracks in the pavement between the rails at the rail joints and over tie rods owing to the nature of the track construction, which the paving contractor, of course, could not remedy. Rigid rail joints were not always secured in the track and cracks may later develop at these. Old rails and old ties were used and these will not give the desired results.



CONCRETE PAVEMENT—MOIST EARTH COVERING TO PRE-
VENT TOO RAPID DRYING OF CONCRETE



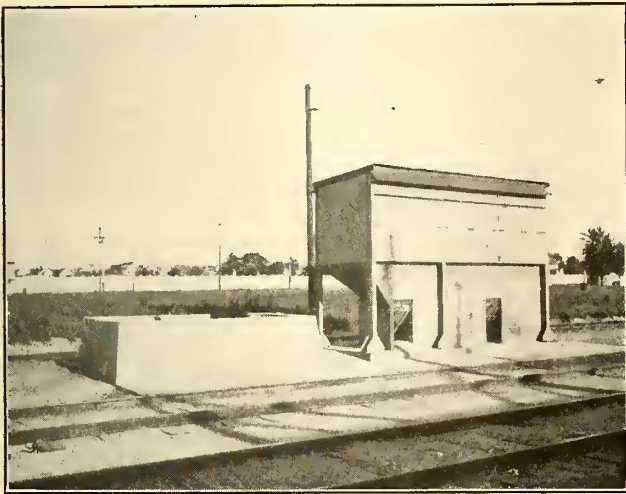
CONCRETE PAVEMENT—FLOATING SURFACE TO FINISH
AFTER STRIKING OFF WITH TEMPLATE

Cleveland Adopts Steel Coal and Sand Storage Bins

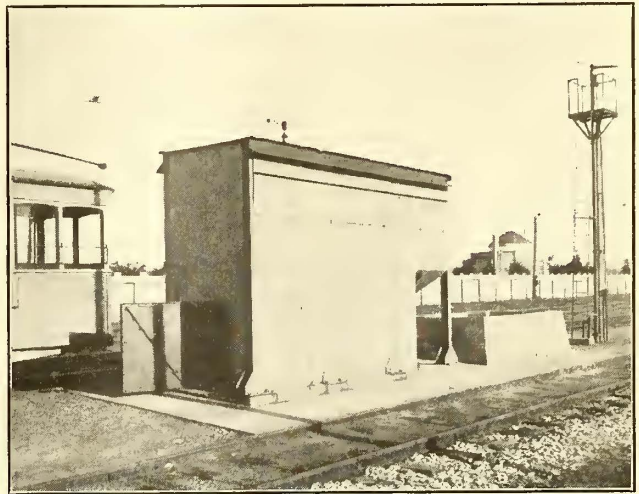
Permanency governed the design and construction of the Cleveland (Ohio) Railways operating station facilities, and in conformity with the general plan the mechanical department designed and constructed standard steel coal and sand storage bins for all of these stations. The steel bins are not only fireproof and waterproof, but they are practically indestructible. In these bins the gravity feed system is employed to supply coal and sand to the buckets, thus avoiding the use of shovels, and materially reducing the time required. The feed system adopted also eliminates waste at the bins, as it includes graduated slides in the chutes which enable the operator to cut off the supply of sand or coal instantly. Aside from the advantage gained by the elimination of waste, the neat appearance of the bins and surroundings is greatly in their favor. The design details of one of these bins is shown in one of the accompanying illustrations, while

two halftones illustrate an installation at one of the company's new operating stations.

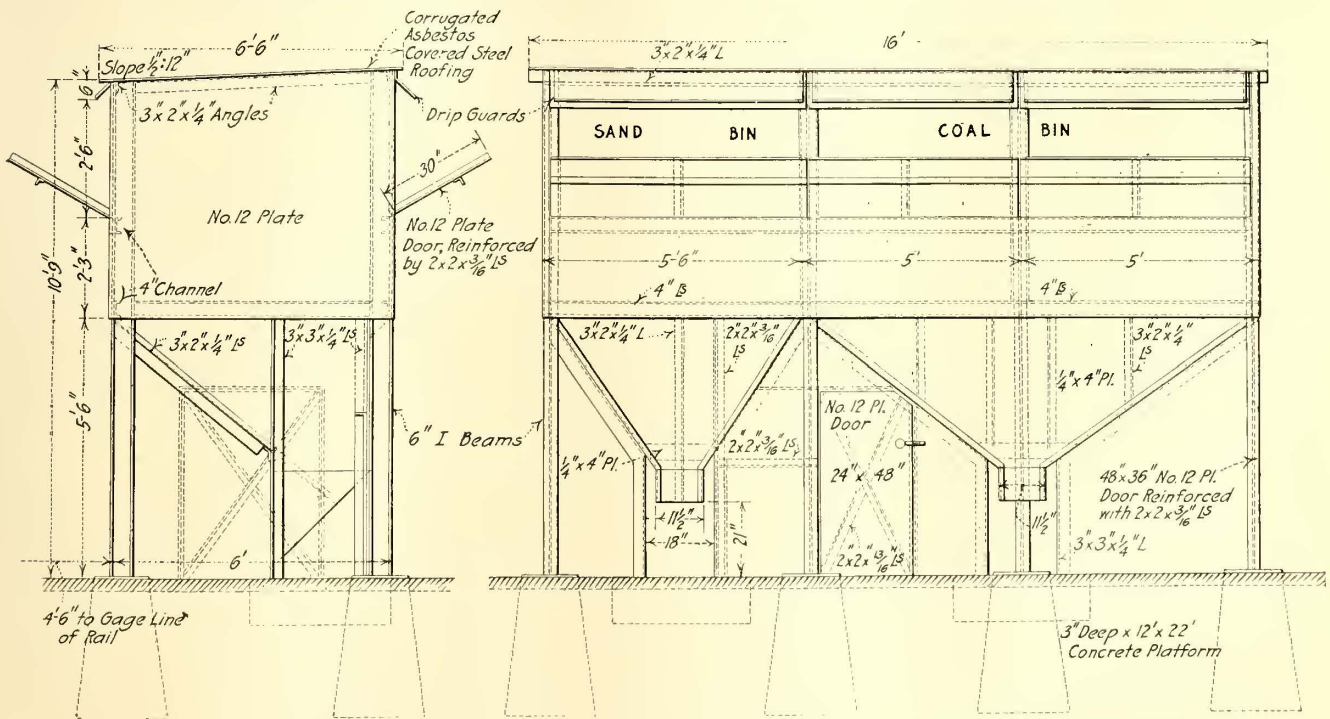
Coal and sand are supplied from a central storage yard, being delivered to the various stations by the company's supply cars. Dry sand is handled in bags, and a plank is laid between the car and the bin so that workmen may carry the bags to the bin door and deposit the sand inside. The coal bin has a capacity for 8 tons of anthracite egg coal, and the sand bin has a capacity for 160 cu. ft. The supply cars delivering coal to these bins have a capacity of 6½ tons, hence, when approximately 1½ tons of coal remain in the bin a fresh supply is delivered. The space below the sloping sides of the bins has been inclosed to provide storage for kindling, coal hods, brooms and other necessary tools which are used by the car cleaning crews. The cost of each bin installed on a concrete foundation and furnished with a concrete platform is approximately \$500. Beside the bin shown in one of the accompanying halftones is one of the railway company's standard concrete trash bins. As a rule



CLEVELAND'S STEEL SAND AND COAL BINS—FRONT OF BIN STRUCTURE



CLEVELAND STEEL SAND AND COAL BINS—BACK OF BIN STRUCTURE



CLEVELAND'S STEEL COAL AND SAND BINS—END AND SIDE ELEVATIONS OF BIN STRUCTURE

three of these combined sand and coal bins are provided in a storage yard at points convenient for the crews to replenish the cars, and a fourth bin is installed near the outlet to the yard beside the loop track, so that it is convenient for the crews on the regular cars when they are being looped for the return trips to the downtown district.

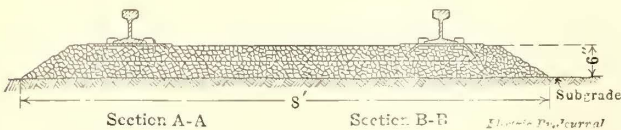
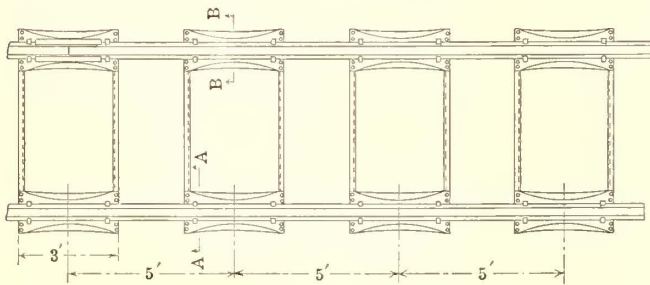
The bins are 16 ft. long over all by 6 ft. 6 in. wide by 11 ft. high. They are supported on substantial frames composed of 6-in., 12.25-lb. I-beam columns with 4-in. channels forming the transverse members. Drop doors, made of No. 12 steel plate reinforced with angles, open just below the roof line on each side of the structure so that the supply cars can refill the coal and sand bins from two sides. The roof is covered with corrugated, asbestos-covered steel roofing, given a slope of 1/2 in. per foot and designed to carry a snow load of 30 lb. per square foot. These bins are painted yellow to conform to the standard color adopted by the railway company for structures of this kind. They were designed in the office of Terrance Scullin, master mechanic, and installed by a contractor.

Steel Tie for Universal Service

In order to provide the greater bearing surface required for sand and other foundations lighter than concrete, The International Steel Tie Company, Cleveland, Ohio, has brought out a modification of its well-known twin steel tie. In the original design, the bearing plates are 13 in. x 36 in. in area and are flat. In the



VIEW OF MODIFIED STEEL TIE CUT AWAY TO SHOW INVERTED TROUGH-SHAPED PLATES



PLAN AND SECTION OF MODIFIED TWIN STEEL TIE INSTALLATION

modified tie the plates are 15 in. x 36 in. and are turned over at the edges, as shown in the accompanying cross-section. This beveling converts the plate into a shallow, inverted trough of maximum bearing surface.

It is obvious that when such a plate is installed it will seat itself firmly in any kind of foundation.

Furthermore, such a plate is particularly desirable for keeping the track in line at curves. It also permits tamping to be done from either side of the rail because the 45-deg. bevel of the plate will retain the ballast that is driven under it regardless of whether the ballast is stone or concrete.

Behavior of Treated Ties in Alkali Soils

In 1907 the Los Angeles & Redondo Railway (now part of the Pacific Electric Railway) treated a few thousand Oregon pine ties with "C-A" wood preserver and placed them in sandy, alkali soil. In 1910 a commendatory letter on the behavior of these ties was received from the engineer of that property; and in May, 1915, H. H. Gerhard, president of the C-A Wood Preserver Company, St. Louis, inspected the same ties. Had it not been for the old rail marks still showing on the ties Mr. Gerhard would not have been able to identify them because the Pacific Electric Railway no longer had the Los Angeles & Redondo Railway records. A photograph taken in 1907 served as first aid in getting the exact location of the ties.

One of the eight-year-old ties was taken out during September, 1915, and one-half of this tie is now in the company's office at St. Louis. Mr. Gerhard states that the solid condition of this tie would lead one to believe that it had been in the tracks only a few months. He also learned from the railway company that on this line the life of untreated Oregon ties does not exceed four years.

Another confirmation of the fact that the use of "C-A" wood preserver on ties resists the alkali action is found in the experience of the Union Electric Light & Power Company of St. Louis. This corporation has a switch track, the ties of which are exposed to hard conditions because cars of wet cinders stand over the ties for a day or so at a time. Four years ago the company asked this manufacturer for advice, fearing that the water which drained through the cinders to the ties might contain sulphuric or other acids. The water was analyzed and found to contain alkali, but no sulphuric acid. Thereupon the Union Electric Light & Power Company was advised to use black or red oak ties dipped in the preservative. This counsel proved correct, for although these ties are of cheap, inferior wood they are still in perfect condition. Heretofore the costlier untreated white oak ties had been removed every two years.

Deterioration of Fusible Boiler Plugs

The recent investigation of fusible boiler plugs, conducted by the National Bureau of Standards, developed the fact that the tin in certain plugs which had failed had become oxidized in service, the resulting oxide, SnO₂, melting above 1600 deg. C. Of four kinds of deterioration noticed one could be pronounced especially dangerous. This consisted in the formation of the above-mentioned oxide, either as a solid mass at the fire end of the plug, or as a network throughout the tin filling.

It was discovered that this form of oxidization in service was dependent on the presence of zinc in amounts as small as 0.3 per cent. Zinc is easily corroded by many kinds of boiler water, and the oxide product of this zinc, together with the tin (which is afterward attacked) may form a solid mass that can withstand the pressure of the boiler even after the uncorroded tin has melted out of the plug. The conclusion arrived at is that only material equal to Banca tin 99.9 per cent pure should be used for boiler plugs.

News of Electric Railways

JOLIET ARBITRATION DECISION RENDERED

Findings of the Board of Arbitration on the Chicago & Joliet Electric Railway

The decision of the board of arbitration selected to adjust the wage dispute between the Chicago & Joliet Electric Railway, Joliet, Ill., and Division No. 228 of the Amalgamated Association was handed down on Oct. 30. The demands of the men for an increase in wages were denied.

The company has been operating under a ten-year working agreement with the union. This agreement went into effect on May 8, 1907. It provides that the schedule of wages may be readjusted every two years upon demand, and in the event of a failure to agree that a board of arbitration be appointed. Prior to the expiration of the two-year period ended July 1, 1915, both the company and the union went on record as desiring a readjustment of the schedule. The company asked for a reduction and the union for an increase in wages.

There have been several supplementary agreements, and one arbitration previously under the contract. The present wage scale ranges from 26 cents an hour on the city lines in Joliet to 30 cents an hour on the Chicago division, a line running into the city limits of Chicago. The company contended that wages should be reduced 1 cent an hour on all lines while the union demanded an advance of approximately 6 cents an hour. Other demands made by the union included increased wages for shop men and a "closed shop."

The representatives of the company and of the men were unable to come to an understanding and each of the parties selected a representative for the board. Eneshia Meers was named by the company and Samuel J. Drew by the men. They in turn chose a third arbitrator. That this last was a difficult proceeding is indicated by the fact that the umpire was not decided upon until Sept. 11, four months after the opening of negotiations, when John W. Doney was appointed. All of the arbitrators are lawyers.

The board convened on Sept. 14. Three weeks were consumed in hearing the evidence and arguments. Counsel for the union stated in his opening address that the demands of the men for increased wages were founded upon the high cost of living and the fact that the men were receiving less than the average rate of wages paid to union labor in Joliet. Motormen, conductors and their wives testified as to what it cost them to live and submitted itemized statements of their expenditures; merchants compared current prices with those of five years ago; union officials, representing practically all the trades, testified as to the rates of wages paid in other industries.

The company based its case largely upon its financial inability to pay even the present rate of wages. In proof of this it exhibited the annual reports to the Illinois Public Utilities Commission. In his argument C. L. S. Tingley, vice-president of the company, proved from the union's own evidence that, while the men were receiving a lower hourly rate than that paid to other union men in the city their average yearly wage was considerably higher than the average yearly wage received in other trades. With regard to the increased cost of living he showed that if the average prices for foodstuffs as given in the union exhibits were applied to the weighted average amounts of food consumed in a workingman's family, as determined by the United States bureau of labor, there had been an increase of only 6 per cent in the last five years, during which time the wages as paid by the company had been advanced nearly double that percentage.

In a majority report, from which the representative of the union dissented, the board first of all concludes that its function is to decide the question of wages only, under the clause in the contract whereby it was created, and consequently if other questions were passed upon the decision with respect to them would not be binding upon the parties. The report, after setting forth the demands of both sides, goes on to make the following statement: "The decision

of these questions necessarily requires an investigation of the financial condition of the company to determine its ability to pay the increase" and finds after stating the figures involved, that such ability is lacking. The inability of the management of the company to raise fares under the city ordinances, it says, makes the improvement of this condition impossible.

There was no question in the minds of the board from their personal knowledge and the evidence as to the wages paid to motormen and conductors on other roads in Joliet and surrounding cities, that the employees of the company were receiving more than the usual rate for such work. It could not be contended, the board said, that the cost of living was higher in Joliet than in contiguous cities with larger population and consequently a living wage was being paid. The report concludes with the following findings:

"1. We find, from the evidence, that the demands of the association, for an increase of the wage schedule, contained in the contract of May 8, 1907, and the amendments thereto, should be and the same are hereby denied.

"2. We also find that the demand of the company for a reduction in the wage scale, contained in said contract, and the amendments thereto, should be and the same is hereby denied."

MUNICIPAL LOOP PLANNED FOR ST. LOUIS

A detail plan for a proposed municipal loop to the downtown district of St. Louis, Mo., in connection with the free bridge has been prepared by Charles S. Butts, chief designing engineer for Director of Public Utilities Hooke, and is being considered by the Board of Public Service of that city. The plan proposes to utilize the old City Hall at Eleventh and Chestnut Streets as a new central interurban passenger station, to be the terminus of all interurban lines entering St. Louis. The old Four Courts will be remodeled and used as a central interurban express freight station, according to the plan, and would be reached by a loop for express cars only. An entrance to Cupples Station for all interurban lines would be provided by a loop on Spruce Street, branching off from the central loop to the passenger and express stations. The Illinois Traction System would be given the desired connection with Cupples station by the Butts plan, provided it will extend its line to the proposed new central passenger station in the old City Hall block.

The construction of the new passenger station will be with an idea of future use by a subway from the west, which Mr. Butts declares must come within a few years to care for St. Louis street railway and interurban lines to Missouri towns adjacent to St. Louis. In carrying out this subway plan Mr. Butts recommends that when the free bridge is completed the train service on the Eads bridge be diverted to the free bridge, leaving the lower deck of Eads bridge and the terminal railroad tunnel available for the interurban electric lines from the East Side. The electrification of the Eads bridge and the tunnel would make necessary an extension of the present tunnel from Eighth and Chestnut Streets, the end of the wagon and street car approach to the free bridge, according to Mr. Butts' plan. Surface stations every two blocks in the shopping district could be installed.

Mr. Butts has expressed the opinion recently that the St. Louis Terminal Railroad will be willing soon to make use of the free bridge for steam traffic and abandon the old structure to electric roads and vehicles. The loop proposed by Mr. Butts would begin at Seventh and Papin Streets, the end of the wagon and street car approach to the free bridge. It would extend north on Seventh Street to Chestnut Street, west on Chestnut to Eleventh, south through the new central interurban passenger station (now Old City Hall) to Walnut, east on Walnut to Seventh and looping back to Seventh Street to the free bridge.

President Kinsey of the Board of Public Service says that public hearings will probably be held on the problem of a municipal loop in connection with the free bridge before a definite decision is reached.

HEARING ON PROPOSED BUS FRANCHISE IN NEW YORK CITY

The question of additional bus lines for New York was taken up again by the Board of Estimate of that city on Nov. 8. This action followed the recommendation made on Oct. 15 by the franchise committee of the board that a franchise be granted to the New York Motor Bus Company to operate buses over 31 miles of streets in the borough of Manhattan. At the hearing on Nov. 8 William D. Guthrie for the Interborough Rapid Transit Company, operating the present subway and elevated lines and the prospective operator of new rapid transit lines now under construction, entered a protest. This company is controlled by the Interborough-Metropolitan Company, which also controls the New York Railways, operating surface lines, and the Fifth Avenue Coach Company, operating motor buses on Fifth Avenue. In the course of his remarks Mr. Guthrie said:

"My client is the largest taxpayer in the city and it is the city's partner in the dual subway systems in which the Interborough has bound itself to invest \$76,000,000 and the city \$66,000,000. The city's good faith is pledged to honest dealing with its partner. There can be no question as to that fair play demands that the city shall not force the surface lines into renewed bankruptcy, which is certain if hundreds of motor buses are allowed to take the cream of the short-haul traffic in the most congested parts of Manhattan Borough.

"If the proposed franchise is granted, there will be competing with subway lines 5.3 miles of 5-cent bus lines and 3.26 miles of 10-cent bus lines; there will be competing with elevated lines 0.10 mile of 5-cent bus lines and 0.31 mile of 10-cent bus lines, and there will be competing with surface lines 5.35 miles of 5-cent bus lines and 5.55 miles of 10-cent buses."

FORT WAYNE STRIKE SITUATION

Governor Ralston Intercedes for Former Employees— Hearing in Bondholders' Injunction Suit

Governor Ralston of Indiana, at the request of city officials of Fort Wayne, Ind., has named eight residents of that city as a "conciliatory" committee to attempt to bring about some settlement between the striking trainmen and the Fort Wayne & Northern Indiana Traction Company whereby the old men may be permitted to go back to work and resume their positions on the cars which have been filled for some weeks by new men employed by the company. The Governor announced the appointment of the committee in a letter addressed to Samuel M. Foster, in which he reviewed the deplorable conditions first brought about by the strike, and the consequent loss of wages to the employees and reduction in revenues of the company. He then called attention to the contract existing between the company and its employees which, the company asserted, set forth a method by which troubles of the kind under consideration could be adjusted, and that this contract is at this time involved in an action in the Federal Court.

The Governor stated that he would not do anything that would affect the contract in any way, and that the course he had determined to pursue must not be interpreted as an expression of his opinion of the contract, that he had no power or authority to interpret it and that this was a matter to be decided by the courts. He therefore appointed the committee of eight business men of Fort Wayne to use their own best judgment as to how to proceed to bring about a settlement, if possible, between the company and its employees. The newly-appointed committee held two meetings on Nov. 4 and stated that they would continue to hold such meetings for some days in an effort to arrive at some solution for a settlement of the differences between the company and its employees.

Judge Anderson in the Federal Court at Indianapolis on Thursday afternoon, Nov. 11, dismissed the action of the United States Mortgage & Trust Company in behalf of the bondholders of the Fort Wayne & Northern Indiana Traction Company for an injunction against Joseph C. Colgan, city officials of Fort Wayne and others to prevent activities against the property rights of the company and interference with its railway and lighting business. The court ruled on two points raised by the pleas of the defendant,

first, that Colgan is a citizen of Illinois and beyond the jurisdiction of the Indiana court, and, second, that the Fort Wayne & Northern Indiana Traction Company is a necessary party to the suit, which would remove the case from the jurisdiction of the United States Court.

On Sept. 27 the employees of the city lines of the Fort Wayne & Northern Indiana Traction Company went out on strike in the face of a temporary restraining order granted by Judge Anderson in the Federal Court. The trainmen violated their working agreement with the company and demanded a new form of contract between the company and the Amalgamated Association involving recognition of the newly formed union and the closed shop. Within a few days the company was in full operation on schedule and new men were assigned to the regular runs. The labor unions then through their officers and sympathizers brought about a boycott of the city lines by intimidation, threatening with discharge from their occupation all persons who rode on street cars. Through city officials and employees the patrons of the lighting service of the company were induced to break contracts with the company and take current from the city lighting plant. The suit for an injunction was brought to obtain relief from these attacks.

NEW TOLEDO MAYOR CALLS FRANCHISE CONFERENCE

Mayor-elect Charles M. Milroy of Toledo, Ohio, called a conference on the afternoon of Nov. 4 to consider the franchise question in that city. The invitation to the conference was sent to Johnson Thurston, president of the Public Utilities Conservation League; James Thompson, president of the Citizens' Franchise Association; Edward P. Usher, president of the Central Labor Union; Carl B. Spitzer, president of the Commerce Club; Henry L. Doherty, of the Toledo Railways & Light Company; Negley D. Cochran, editor of the *News-Bee*, and to the editors of the *Times* and the *Blade*. In his invitation to the conference the Mayor said:

"Believing that the people of Toledo want the street car question settled at once by the adoption of an ordinance which is just to every interest, and in the framing of which every interest has had its view, I venture to invite you to meet with representatives of the other organizations which took an active part in the recent franchise election, at the Commerce Club, for the purpose, if possible, of devising some proper plan or agreeing upon an ordinance which will be wholly just to the people of Toledo and to the company while it operates under the same, and will absolutely assure the right of the city to take over the street railway when it is ready and able to do so."

At the conference, attended by all but three of those who were invited, an informal organization was formed to push the proposal for an immediate settlement of the street railway question. Mr. Milroy announced to the conference that it is not his intention to preside at the subsequent meetings. He said:

"This question fills the whole civic horizon. I am anxious to have it settled early in my administration, so we can go ahead with other constructive work. For this reason I am offering my good offices to get together the factors which were most energetic in the recent campaign in which the Dotson ordinance was defeated. I myself am favorable to municipal ownership, as you know, and I do not believe that any franchise ordinance will be accepted by the people which does not make clear and indisputable the right of the people to take over the street railway system whenever they wish it. We can't get anywhere while we are all working at cross-purposes. We are all for Toledo and wish to play the Toledo game. We want to see Toledo go ahead. This is the spirit the newspapers have been advocating. Therefore, it seems to me to be the most propitious time to get the forces together. Having done that, I will step out. I have no plan to offer."

Previous to the meeting on Nov. 4 Mr. Doherty was reported to have said:

"It is our intention to do the best we can under the circumstances. If we can obtain any more money for the improvement of the property without a franchise we will do that, but I deem that is impossible. I shall wish to consult with other members of the company before I make any definite announcements as to future policies."

SEATTLE COMPANY'S CASE FOR RELIEF FROM PAVING EXACTIONS

Charles A. Reynolds, chairman of the Washington State Public Service Commission, has fixed Feb. 1 as the date for a hearing on the petition of the Puget Sound Traction, Light & Power Company, Seattle, to be relieved of certain of its franchise obligations.

The petition of the company asks that an order be made by the commission relieving it of franchise obligations requiring it to pave its right-of-way at the same time the city paves the remainder of the street; requiring the payment of 2 per cent of its gross earnings annually to the city and the payment of a portion of the cost of construction of bridges utilized. In 1914 the 2 per cent of the gross earnings amounted to nearly \$72,000, and the paving item amounted to considerably more, inasmuch as the company is required by its franchise to pave with the same material, and in the same manner, the 18 ft. in the center of the street at the same time the city paves the remainder of the street. Officials of the company assert that the Second Avenue repaving job, carried out last year, included new track construction, and cost the company about \$90,000.

In fixing the date for a hearing on the petition the Public Service Commission declines to accept the offer of the company to advance \$10,000 for the completion of the commission's valuation of the street railway property in Seattle. In advising the City Council of the rejection of the offer, and the fixing of the date of hearing, the commission points out that the company has expended large sums of money for experts in the valuation of its properties, and that common justice demands that a hearing be granted. The commission will allow the city to use all of the data now in the possession of the commission and authorize the city's experts to investigate the books and accounts of the company, to ascertain the true value of its properties.

The valuation placed on the property of the Puget Sound Traction, Light & Power Company, exclusive of power, by experts employed by the company is \$19,737,122 as of March 31 last. The gross earnings of the company for the last fiscal year were \$3,474,885. Including an item of \$288,105 for depreciation, the net earnings for the year were \$537,105, which equals a return of 2.71 per cent on the money invested. The valuation of the company's properties was undertaken by the Public Service Commission more than a year ago, and the work was about three-fourths done when it was abandoned because of lack of funds. It was because of this situation that the company offered to advance \$10,000 to complete the valuation, with the understanding that the commission would ask the next Legislature to make an appropriation to repay that amount.

PRESIDENT PELLISSIER TESTIFIES IN HOLYOKE ARBITRATION

The arbitration board sitting in the wages and hours of work case of the Holyoke (Mass.) Street Railway was scheduled to reconvene on Nov. 12 at Holyoke, following a recess of about a week. At the hearings last week L. D. Pellissier, president of the company, was called to the stand and testified at length upon the company's history, its consolidation with the former Amherst & Sunderland Street Railway, and the working agreement last framed. It was arranged that the arbitrators should receive a copy of all agreed matters to assist in the decision of those in dispute. Mr. Pellissier said that as a rule the company's employees did their work well, but that he was not prepared to say that he would grant increased wages at present, even if the money for this purpose were available. Between 1903 and 1912 hourly rates rose from a minimum of 20 cents to a maximum of 26.75 cents, with reductions in the graduated scale to four years. Since 1891 the company has paid dividends at the rate of 8 per cent, but has not earned the dividends in the last three years. No signed agreement with the union dated back of 1912. At the last hearing representatives of the men urged that the board refuse to consider the financial condition of the company as a factor in the wage issue, and various testimony relative to the increased cost of living was submitted by the men. A former president of the union admitted that the steadiness of the work was a good feature of car service.

ELECTION AFTERMATH AT CLEVELAND

As soon as the franchise vote in Lakewood, suburb of Cleveland, is legally certified the Cleveland (Ohio) Railway will put the new system of fares into operation, and ten-minute service will be restored to the Clifton Boulevard line. The rate of fare between points in Cleveland and any point in Lakewood will be 5 cents straight instead of eleven tickets for 50 cents. Within the city of Lakewood the fare will be at the rate of five tickets for 15 cents, the same as in Cleveland.

The company has not yet devised a system of payment whereby passengers between points within Lakewood and those riding between Lakewood and the city can be identified. Officials of the company are of the opinion that the receipts from Lakewood business will not be materially affected by the change. While the fare between cities will be slightly higher, the Lakewood reduction will just about offset the gain. The traffic within the city of Lakewood is heavy, as there are a number of very large factories on the south side of the town and many of the employees live within its limits. One of the provisions of the franchise is the extension of the double track on Madison Avenue from West 117th Street to Rocky River, a distance of 2½ miles. Work on this extension will be begun as early in the spring as possible.

On Nov. 3 the Cleveland Railway filed with the District Board of Complaints a demand for a reduction of almost \$500,000 in the valuation of its real estate, made for tax purposes in 1914. It claims its property has been appraised at almost double the amount fixed on adjoining property. If the appraisement is reduced to the amount fixed for 1913, the company expresses its willingness to pay the taxes. Theodore Bates, president of the board, expressed the belief that the demand has merit. This board must consider the demand and then consult the State Tax Commission and the local deputy tax commissioners.

RIOTING MARKS ATTEMPT OF WILKES-BARRE COMPANY TO RESUME OPERATION

After the first attempt to operate cars on Nov. 4 had resulted in the show of disorder by strike sympathizers, T. A. Wright, general manager of the Wilkes-Barre (Pa.) Railway, held a conference with Mayor Kosek and agreed to allow the city authorities twenty-four hours in which to perfect the police organization before again trying to run cars. The Mayor consequently swore in 100 special policemen. Half of this number were turned over to a former member of the State Constabulary who drilled them for mounted police duty. The other fifty men were spread over the city to do patrol duty in place of the regular patrolmen, who were placed on posts and held as reserves to meet riot calls. This truce of holding the cars in the car-house did little good, for during the following day strike sympathizers tried to rush the Wood Street carhouse where the new men are quartered. As a result of this attack a number of shots were fired and three of the attacking party were hit.

Later in the day, Sheriff Kniffen refused to swear in as deputy sheriffs the 250 new men engaged by the company. He defended his stand on the ground that there are plenty of men in Luzerne County whom he can call in case of emergency. The sheriff, however, sent an appeal to the State Constabulary for aid in preserving order in the outlying towns. About fifteen men arrived as a result of this request, to aid the troops regularly stationed near Wilkes-Barre.

Other attempts by the company to operate cars on Saturday were met by rioting, particularly in the suburban districts. Public Square Park, where rioting had occurred earlier in the week, has been roped off and no one was permitted to enter.

Late on Nov. 6 some of the engineers and firemen at the power plants left their posts and joined the striking trainmen. The company, apparently anticipating this move, pressed other men in their places.

Continued rioting by mobs that gathered all over the territory served by the lines of the company prompted Sheriff Kniffen to appeal to the authorities at Harrisburg to send 100 additional men of the State Constabulary to aid in pre-

serving peace. The company has succeeded in opening more lines each day and several additional cars have been placed in operation on the lines which were reopened last week.

The latest show of feeling against the State Constabulary by the labor unions is the injection of politics into the strike situation by the action of residents in several of the suburbs in campaigning for legislative candidates known to be in favor of the abolition of the Constabulary. The Burgess of Edwardsville, a suburb, where much of the most vicious rioting has occurred, requested the Sheriff to withdraw the State police from that borough, asserting that they were not needed there to preserve order. In view of the facts the Sheriff ignored the request.

Letters containing threats to dynamite the residence of Mr. Wright have been sent to servants in his employ. Other letters threatening violence have been received by Mr. Wright.

SPRINGFIELD TROLLEY SERVICE CONFERENCE

Service on the Springfield (Mass.) Street Railway is at present under investigation by the Board of Aldermen. At a conference on Nov. 9 Clark V. Wood, president of the company, stated that traffic difficulties at this time are due to the following: the institution of the eight-hour day in manufacturing plants engaged in filling war orders and other work, which has increased the rush-hour peak load; temporary congestion at the Plainfield Street bridge, and the necessity of routing practically all cars through Main Street. Eighty-eight regular cars are now running, and to meet the evening rush traffic eighty-one extras are being used, compared with eighty-seven regular and forty-four extras last year. Additional cars, crews and inspectors have been put on and soon the company will have twenty-nine more cars in service than a year ago. Delays at the Plainfield Street bridge will be reduced greatly in the future and service at the Carew Street carhouse will be improved by the construction of a new carhouse at Hooker Street. H. M. Flanders, general manager, said that thus far there seemed to be no legal means to stop smoking by passengers in car vestibules. The gross earnings are 5 per cent better than a year ago, but the service is 33 per cent greater. Mr. Flanders said that the company hoped to begin the construction of a new carhouse and shop at Hooker Street at a cost of \$250,000 inside of a few months. Postmaster Thomas J. Costello of Springfield said that the company was giving first-class mail car service; that the cars were almost invariably on time and the crews diligent. Recognition of the company's financial burdens and of insubordination in the ranks of union employees has been emphasized by citizens as contributory causes of present operating difficulties.

NEW YORK COMMISSION INQUIRY

The inquiry being conducted by the Thompson legislative committee into the workings of the Public Service Commission of the First District of New York was turned during the latter part of the week ended Nov. 6 into an investigation of the holdings of Chairman Edward E. McCall, prior to his appointment, in the stock of the Kings County Electric Light & Power Company. The par value of the stock with the accretions due to the exercise of subscription rights subsequent to the original purchase is about \$50,000. The holdings are in four certificates. Three are for 100 shares each and one for eighty-seven shares.

Mr. McCall insists that the stock was transferred to his wife just before he was appointed to the commission. It appears, however, that since 1908 the stock has been held in the name of John J. Mackin, Mr. McCall's former court officer, although a separate power of attorney or memorandum for transfer to Mrs. McCall was made out but never exercised. Mr. Mackin understood that the stock was Mrs. McCall's and he indorsed the dividend checks to her.

Commissioners McCall, Hayward and Williams were all examined by the committee on Nov. 11. Mr. Hayward said that there were 119 cases before the whole commission since April 1 last and that all the commissioners were present at fifteen of these cases. The record of attendance for the cases was: Hayward, seventy-nine; Williams, seventy-nine; Wood, seventy; Cram, thirty-five; McCall, thirty.

BAY STATE OPENS FARE CASE

Entire Financial and Operating History of Company Subject to Investigation—Hearings May Last Several Months

The Bay State Street Railway fare case was opened before the Massachusetts Public Service Commission at Boston on Nov. 8. So great was the popular interest in the petition for the right to establish a 6-cent unit, with local modifications, throughout the Massachusetts lines of the company, that the commission transferred the hearing to Kingsley Hall, Ford Building. James F. Jackson, former chairman of the Massachusetts Railroad Commission, and Sheldon E. Wardwell, Boston, appeared as counsel for the company. About 100 counsel and officials were registered in opposition on behalf of municipalities served by the company. No official opposition developed, however, from the city of Boston on the opening day.

Chairman McLeod of the commission announced in opening the hearings that the company's case will first be presented, after which an interregnum will be allowed to permit ample study of evidence by the rebuttal. It is expected that the case will be on the docket for many weeks if not for several months, as the commission ruled on the opening day that the entire financial and operating history of the company may be subject to investigation, without necessarily limiting inquiry to matters subsequent to decisions of the former Railroad Commission.

In his opening statement, Mr. Jackson emphasized the faith of the management in the fair-mindedness of the public, once the issue is understood. The company now consists of thirty-eight formerly separate roads consolidated into a single system of about 940 miles of track. In the consolidation process union took place upon the common basis of a share for share exchange; the aggregate stock and indebtedness was not increased, and reductions in fare and additions to facilities were immediately realized. Those behind the enterprise believed that through possible economies and a greater financial strength, the outcome was bound to be a larger and better public service with fair return upon private investment. Events have proved that they were too optimistic about some things, mistaken about others and fated to meet obstacles that the wisest would never have foreseen. Traffic increased, but not at the rate predicted; repairs and reconstruction requirements mounted beyond anticipation; advance in wages and in cost of supplies, competition with other kinds of transportation, seasons of business depression and the multiplication of demands from municipal authorities made inroads upon income that were not anticipated.

In the last fifteen years the company has been compelled to contribute millions of dollars to the cost of constructing, maintaining and improving highways and bridges, eliminating grade crossings and developing parks and boulevards. The following table is significant:

	1901	1915
Taxes	\$341,569	\$653,380
Construction and maintenance, highways and bridges	\$567	\$287,727
Platform expenses in per cent of operating revenue	25.29	29.80
Total operating expenses, in per cent of operating revenue	61.38	72.04

The total amount paid by the Bay State and constituent companies from 1892 to 1915 for paving alone aggregated nearly \$4,000,000.

The total outstanding securities of the Bay State company and its leased lines in Massachusetts are \$47,534,500. Though these securities are lawfully outstanding, this capitalization undoubtedly represents to a greater or lesser extent over-issue of securities in the early history of constituent companies, which cripples it as a measure of capital cost. The construction account is \$46,559,327, but this is in insufficient detail, owing to practice in bookkeeping before the consolidation was effected. As a basis for fare readjustment, the company engaged Sloan, Huddle, Feustel & Freeman, Madison, Wis., to make an inventory of the property. They placed the investment cost of the property in Massachusetts at \$43,635,365. In the same report the reproduction cost appeared as \$46,361,266.

The company requires additional yearly revenue to the

amount of \$1,615,165 in order to pay a reasonable return (taken at 7 per cent) upon its investment. The imperative feature of the situation is not a call from present stockholders for larger dividends, but the necessity of continuing dividends in order to get the new money required in conducting the service. In other States companies are generally given a free hand to obtain money upon stocks or bonds, but in Massachusetts capital cannot be obtained upon bonds until an equal amount has first been obtained upon shares of stock issued at not less than par. Unless the risk of the business is reduced so that money is ready to take it, i. e., unless reasonable dividends are practically assured, the financing of a railway comes to a halt, and extensions and improvements stop. Dividends for the last fifteen years have averaged only 4.9 per cent. The benefits of centralization have been enjoyed by the communities served, and as a direct result of consolidation there has been a saving in interest of more than \$1,000,000, reducing to that extent the amount upon which future returns on capital are based and depreciation calculated in connection with the proposed increase in revenue. In view of the uncontrollable increasing costs the company submits that additional revenue is imperative.

At the hearing on Tuesday, Nov. 9, the company agreed to provide a considerable number of blue printed copies of tabular data for the use of town and city counsel. Charles R. Rockwell, vice-president and treasurer, then reviewed the company's financial history in detail. The surplus account was \$794,565 in 1901, compared with \$5,751 in 1915. In this period investment increased \$18,270,453, or 62.17 per cent, and operating revenue increased \$3,720,515, or 66.2 per cent; while operating expenses, including taxes, increased \$3,683,978 or 97.18 per cent.

Robert M. Feustel of Sloan, Huddle, Feustel & Freeman, then took the stand. He described the methods utilized in taking the Bay State inventory and presented the results of eighteen months' work in this connection by an average staff of fifty men. A description of these methods and a summary of the results obtained and presented at the hearings will be published in a later issue of the *ELECTRIC RAILWAY JOURNAL*. The inventory was made on the basis of the detailed investment in the property checked by an exhaustive survey of the physical plant with items listed according to the Interstate Commerce Commission classification of accounts.

At the hearing on Nov. 10 Mr. Feustel continued the presentation of the valuation report, after which adjournment was taken to Nov. 16, at which time the commission will hear counsel as to the jurisdiction of the board in the matters at issue. Counsel in opposition to the company raised the point that the proposed fare increase is an interstate matter and therefore subject to the jurisdiction of the Interstate Commerce Commission.

NEW LOCKPORT-NIAGARA FALLS LINE OPPOSED

The Public Service Commission for the Second District of New York has received final briefs in the petition of the Niagara River & Eastern Railway for a certificate to build and operate a double-track electric railway for passenger and freight service between Lockport and Niagara Falls, N. Y. The proposed line is opposed by the New York Central Railroad, which claims that Niagara County has adequate railroad facilities at present and that its road with the aid of the International Railroad is capable of handling more business than the section produces. It also maintains that a permit to a new road would be unfair to the vested interests of stockholders in existing lines. The Niagara River & Eastern Railway purposes to connect with the International Railway and the Buffalo, Lockport & Rochester Railway at Lockport and with trunk lines of steam railroads in Canada by means of a new bridge across the Niagara gorge at or near Lewiston. It is also proposed to handle freight on the Buffalo, Lockport & Rochester Railway and connect with the Erie and the Pennsylvania Railroads at Rochester. Charles Hickey, Lockport, is president of the Niagara River & Eastern Railway, and officials of the International Railway, Buffalo, and the Beebe syndicate, which owns the Buffalo, Lockport & Rochester Railway, are connected with the new project.

New Oregon Line Opened.—The Willamette Southern Railway, extending from Oregon City, Ore., to Mount Angel, a distance of 32 miles, has been opened for traffic. Grant V. Dimmick, Oregon City, is president of the company.

Clay County Appeal Made.—The appeal in the case of the Interstate Railway vs. the Kansas City, Clay County & St. Joseph Railway to the Supreme Court of Missouri against the recent verdict for \$1,500,000 in favor of the plaintiff has been perfected by the filing of a bond for \$3,400,000 given by the National Surety Company. Judge Woodson of the Supreme Court approved the bond. This assures the case being heard on the appeal in the highest court of Missouri.

Albany Arbitration Postponed.—On account of the absence of Judge William E. Woollard from Albany, N. Y., on Nov. 4 the meeting of the United Traction Company arbitrators was postponed until Nov. 19. The arbitrators, Judge Lynn J. Arnold, chairman; Mayor Cornelius F. Burns of Troy, and Judge William E. Woollard of Albany will take up the question of the differences between the company and its employees which led to the strike of Sept. 6.

Maine Trolley Plan Revived.—It has been announced at Bangor, Me., that financial arrangements have been completed for the construction of a 23-mile electric railway from Mattawamkeag to Millinockett and East Millinockett, between the Maine Central and the Bangor & Aroostook Railroads, under a charter held by C. W. Mullen and I. B. Wood, Bangor; Artemus Weatherbee, Lincoln, and Frank J. Rich, Mattawamkeag. Power is to be derived from a privilege on the Mattaceunk stream. Stone & Webster, Boston, Mass., are the fiscal agents, and a survey under their direction indicates a favorable route.

Trade Commission Extending Export Inquiry.—The Federal Trade Commission is sending out 30,000 letters of inquiry, followed up by a brief schedule, as a part of its investigation of conditions that affect American foreign trade. A return postcard accompanying the letter is designed to give the commission a broad yes or no referendum on the advisability of export combinations, and to put it in touch with those who are willing to assist the commission by furnishing further facts and suggestions. The schedule inquiries are only one part of the study of conditions which may affect American export trade being conducted by the commission. It has also held a series of public hearings; is engaged on systematic research work covering trade and financial papers, official publications and reports of the United States and foreign governments and other published material, and will send agents abroad to study conditions on the ground.

Ontario Board Refuses to Interfere.—The Ontario Railway Board has refused to interfere in the Yonge Street extension difficulty, pending a decision by the Privy Council upon the legal position of the Toronto Railway and the city. The company sought to have the board enforce its order directing the city to do the preliminary work for the construction of the extension, but the board held that the city's appeal to the Privy Council should be disposed of first. H. S. Osler, appearing for the company, was sure that the Privy Council would uphold the company's right to extend to Farnham Avenue, but added that, if the company were allowed to go on with the construction now, and the decision was an adverse one, it would immediately hand over the extension to the city at cost. Chairman McIntyre pointed out that the validity of the board's order rested upon the construction of the agreement between the city and the company. He did not think the board could facilitate the carrying out of the order so long as there was any doubt as to the legal basis upon which the order rested.

New York Authorizes Another Rapid Transit Route.—The secretary of the Public Service Commission for the First District of New York has reported to the commission that the necessary number of property owners consents have been obtained to legalize Route No. 61, the so-called Sixtieth Street-East River route. This line is a two-track underground railroad, beginning in Fifty-ninth Street west of Fifth Avenue. It curves diagonally under Central Park

and Fifth Avenue into Sixtieth Street, runs through Sixtieth Street to and under the East River to North Jane Street, Long Island City, where it will emerge from the ground and connect with the new elevated lines in Queens Borough. On the Manhattan side the new route connects with the Broadway, Seventh Avenue and Fifty-ninth Street line, which is for operation by the New York Municipal Railway Corporation. The new route is made necessary by the substitution of the river tunnel for the use of the Queensboro Bridge, as at first proposed by the commission. The change in routes was made at the request of the Board of Estimate & Apportionment of the city.

Terre Haute Abandonment Case Settled.—In the Superior Court at Terre Haute, Ind., on Nov. 3, in the suit of the city of Terre Haute vs. Terre Haute, Indianapolis & Eastern Traction Company, an agreement was reached between the parties whereby the company agreed to return to the city the street known as Cherry Street, one block in length, between Eighth and Ninth Streets, which had been vacated by the city in favor of the company by order of the City Council of Terre Haute in December, 1910. The order was made at that time in consideration of the company giving to the city a tract of land adjoining the alley between Eighth and Ninth Streets, it being thought desirable at that time to make such an agreement to provide a proper site for an interurban terminal building which the company proposed to erect in Terre Haute. At the present time only a temporary one-story building has been erected on the terminal building site, although the Arcade Building, which gives a direct entrance from Wabash Avenue to the proposed terminal station, has been completed for some time. By the new order of the court the city agrees to vacate the platted alley running north and south through the land used by the traction company for a site for its terminal station.

PROGRAMS OF ASSOCIATION MEETINGS

National Railway Appliances Association

The eighth annual exhibition of the National Railway Appliances Association will be held at the Coliseum and Annex, Chicago, Ill., beginning on March 20 and concluding March 23. During the same week the seventeenth annual convention of the American Railway Engineering Association and the March meeting of the Railway Signal Association will be in session at the Congress Hotel. The meeting of the Association of Railway Telegraph Superintendents will be held during the same week at Chicago. These annual exhibitions are for the purpose of exhibiting the products of members of the National Railway Appliances Association in the field of steam and electric railway construction, maintenance and operation. Applications for space by intending exhibitors should be made to C. W. Kelly, secretary-treasurer of the National Railway Appliance Association, 122 Michigan Avenue, Chicago.

Central Electric Railway Association

The program has been announced for the fall meeting of the Central Electric Railway Association, to be held at the Claypool Hotel, Indianapolis, Ind., on Nov. 18 and 19. The business session and the presentation of reports of committees are scheduled for 9 a. m. on Nov. 18. The other program for that day follows:

Address, "The Question," by G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Address, "The Interurbans," by J. F. McClure, of the Public Service Commission of Indiana.

Lecture and motion pictures, "From Ore to Finished National Pipe," by W. A. Phillis, metallurgist National Tube Company, Pittsburgh, Pa.

The program of papers for Nov. 19 follows:

Paper, "Automatic Substations," by Edward Taylor, engineer General Electric Company, Chicago, Ill.

Paper, "Package Freight on Passenger Cars," by J. F. Strattan, treasurer, and W. L. Foreman, trainmaster Louisville & Northern Railway & Lighting Company, New Albany, Ind.

Financial and Corporate

ANNUAL REPORT

Boston Elevated Railway

The statement of income, profit and loss of the Boston (Mass.) Elevated Railway for the fiscal year ended June 30, 1915, follows:

Gross operating revenues.....	\$17,798,607
Operating expenses:	
Maintenance of way and structures.....	\$1,429,567
Maintenance of equipment.....	1,203,351
General expenses.....	1,738,629
Traffic expenses.....	5,290
Transportation expenses.....	5,620,829
Power.....	1,290,317
Total operating expenses.....	\$11,287,983
Net operating revenues.....	\$6,510,624
Non-operating income.....	87,942
Gross income.....	\$6,598,566
Payments on account of leased lines.....	3,056,011
Balance.....	\$3,542,555
Other deductions from income.....	2,218,336
Net income.....	\$1,324,219
Dividends.....	1,313,367
Surplus for year.....	\$10,852

The operating revenues and the non-operating income together increased \$100,571 or 0.56 per cent during the year, the gain of \$168,991 or 0.96 per cent in operating revenues being cut to this figure by a decrease in non-operating income. The operating expenses decreased \$9,878 or 0.08 per cent, but the total charges against income for taxes, rent of leased roads, rent of subways and tunnels, and interest on funded debt, unfunded debt and miscellaneous items increased \$223,399 or 4.4 per cent. Consequently not only was the increase in gross income absorbed, but the net income as compared with the preceding year was reduced \$112,949 or 7.8 per cent. Taxes increased \$28,242, rent of leased roads \$61,087, rent of subways and tunnels, \$147,595 and miscellaneous \$4,587, small decreases in some items and adjustments in accounts giving the preceding net increase of \$223,399. The taxes would have shown a much greater increase if the capital stock of the West End Street Railway and the Boston Elevated Railway had not been abnormally low on April 1.

In regard to the Cambridge subway it is said that neither any increase in business nor the incidental economies effected were sufficient to take care of the large increase in annual charges made necessary by the additional investment, which, with the Boston connections, amounts to \$12,293,604. At present the loss in net revenue caused by the construction of the Cambridge subway, including additional taxes, interest and dividends on the investment, is estimated to be approximately \$315,000 per annum.

The total requirements for taxes, rentals, interest and dividends at the rate of 6 per cent call for \$6,702,523. The amount of income actually available therefor this year was only \$6,598,566. Hence the earnings were sufficient to pay only 5½ per cent dividends and to allow \$10,852 to be credited to surplus. The payment of reasonable dividends is said to be important in connection with the obtaining of new money to meet growing public demands for improvements, and the directors state their firm conviction that in the near future some adequate provision must be made for a substantial increase in the next income of the company. During the last year the total revenue passengers carried increased 3,135,535 or 0.91 per cent, and the operating expenses showed a slight decrease, as before noted, but in the judgment of the directors no adequate relief should be expected from the ordinary increase in business, from a reduction of operating expenses or from any decrease in the charges ordinarily incident to the capital investment.

In speaking of the difficulties surrounding new security issues the report says that under the law in force in Massachusetts the amount of bonds which the company may issue is limited to the par value of its capital stock plus paid in premiums. The company can now issue, therefore, only \$3,286,828 of additional bonds until it has issued additional stock. New stock cannot be issued for less than par, and

the outstanding stock is at present quoted on the market at substantially below par. Under present conditions, therefore, the company has no means of providing additional capital of its own for paying for further additions or improvements to its property by the issue of either additional bonds or stock. Any additional money can be obtained only by short time loans, which method of financing is unsafe and not to be used if it can be avoided, or by the issue of West End securities as far as additions are made to the leased property.

The relation between the increases in investment and in total receipts of the company is well brought out in the report. In 1897, just prior to the lease of the West End Street Railway by the Boston Elevated Railway, the investment in street railway properties of the West End Street Railway was \$25,291,913. On June 30, 1915, the investment of the system operated by the Boston Elevated Railway in substantially the same territory, including subways, was \$112,013,280. This last amount does not include either the East Boston Tunnel extension (estimated cost with equipment, \$3,000,000) or the Dorchester Tunnel (estimated cost without equipment, \$9,900,000), which have not yet been completed. During the same period the total receipts of the system increased from \$8,719,032 to \$17,886,549, or 105 per cent. The increase in the investment was 343 per cent. Of this increase in investment more than 69 per cent is represented by the cost of \$26,414,878 for the elevated structure and its stations and the cost of \$33,394,532 for the subways with their connections. In 1897 the investment was \$2.90 for each \$1 of total receipts. In 1915 it was \$6.26 for each \$1 of total receipts.

During the year the company added a net of 5,345 miles of surface track, making the total now 520,722 miles. It expended for reconstruction and maintenance of tracks \$617,399 or \$1,272 per mile for surface lines and \$83,967 or \$2,278 per mile for rapid transit lines. On buildings the maintenance and repair costs totaled \$119,158. The company put in operation during the year forty-three stepless prepayment middle-entrance vestibule cars, and it received 100 large trailer cars. Two-car train operation so far has proved satisfactory, and it is the present intention to buy twenty-five more such cars.

In connection with transfers it is noted that the number of points at which transfers are honored is 109. The paper transfers issued for the year ended June 30, 1915, totaled 104,307,102. The number of paper transfers received during the same period was 83,415,829. It has been estimated that if at fourteen points where paper transfers are now issued paper transfers can be done away with the company can eliminate 64 per cent of all paper transfers. In other words, it would have left ninety-five points at which there would be received only 36 per cent of the present paper transfers. The company is making careful studies to determine what paper transfer points can be transformed into points for bodily transfers without paper tokens.

The cost of the safety-first campaign during the year was \$3,188. The result of the campaign in the reduction in accidents may be summarized as follows: "For July, 1914, when a special account was kept, there was a total reduction of 25.3 per cent in the number of accidents reported as compared with July, 1913, and this in spite of an increase of 9.9 per cent in the number of passengers carried and an increase of 6.8 per cent in the number of trips run."

The net cost to the company of the workmen's compensation act for the year 1913-1914 was \$59,109; for the year 1914-1915 by estimate, \$76,184. The Legislature of 1914 increased substantially the benefits to be received by injured employees and the new law went into effect on Oct. 1, 1914. This accounts for the increased cost over preceding years, although the number of employees injured has slightly decreased.

Operating officials of the company believe that during the next year the freight and express business will be substantially increased on account of the additional facilities which are to be provided. Moreover, the public has had an opportunity to see that the company can fittingly enter this field and at the same time perform the service without in any way interfering with the proper operation of the company's primary business of carrying passengers.

STOCKHOLDERS IN KANSAS CITY

Supplementary Plan for Reorganization Provides for Segregation of Railway and Lighting Properties and Deposit of Old Stocks

The final section of Judge Hook's plan for a reorganization of the Kansas City Railway & Light Company, Kansas City, Mo., was made public on Nov. 8. In this the way in which the stockholders will be taken care of in the adjustment is provided for. The section is supplemental to the court's plan announced on July 30, 1915, which made provision for the bondholders of the New Jersey holding corporation and those of the underlying properties. Two commissioners, W. W. Gurley of Chicago and John H. Atwood of Kansas City, have been appointed to carry out the stockholders' plan, and all creditors and stockholders must file with these commissioners their claims and acceptances of the plan before Dec. 20.

As previously announced, the plan insists upon the complete dissolution of the railway and light company. It provides that 80 per cent of the outstanding stock shall determine the basis of division as between the two companies. The stock of these two segregated operating companies shall be deposited with two sets of three trustees each, one to be selected by the preferred stockholders, another by the common stockholders, and the third by these two. They will issue preferred and common beneficial certificates, one for each share of stock now outstanding. The old status as between preferred and common stocks to be maintained as between the preferred and common beneficial certificates, except that the preferred is to be cumulative instead of non-cumulative.

The stock deposit committee is composed of the following men: George M. Reynolds, chairman; G. W. Bacon, New York; Oscar Fenley, Louisville, Ky., and H. T. Abernathy, Kansas City, Mo. More than 90 per cent of each class of stock has been deposited with the committee, which met on Nov. 6 and voted to submit the entire plan in all its details to the stockholders immediately. In the meantime all non-depositing stockholders will be offered further opportunity to participate.

RECEIVER FOR EMPIRE UNITED

Default in Bond Interest Leads to Friendly Receivership For Purpose of Readjusting Finances of Company

Owing to a default in the bond interest due on Nov. 1 Justice W. S. Andrews on that date appointed H. S. Holden as receiver of the Empire United Railways, Inc., Syracuse, N. Y. The interest due was approximately \$122,000 on bonds of the Rochester, Syracuse & Eastern Railroad and \$70,000 on bonds of the Syracuse, Lake Shore & Northern Railroad and the Auburn & Northern Railroad. Justice Andrews directed that the interest coupons of the Syracuse, Lake Shore & Northern Railroad and Auburn & Northern Railroad be paid by the receiver on Nov. 2. The principal cause of lack of revenue was the general falling off in receipts during the last season. Contributing factors were the good highways paralleling the Rochester-Syracuse division, the excessive amount of rainfall this season, the prevailing business depression and an unfavorable contract for entrance into Rochester and labor troubles.

The appointment of Mr. Holden, who is vice-president and a director of the company, was the result of a friendly action looking toward a readjustment of the company's finances. A representative of the Attorney-General's office of the State of New York filed an objection to the appointment of Mr. Holden on account of his relation to the company, but Justice Andrews decided to make a temporary appointment. On Nov. 27, however, he is to hold a hearing for the purpose of determining whether or not Mr. Holden's receivership shall be made permanent. In the meantime, a bondholders' committee has been formed, consisting of A. W. Loasby, president Trust & Deposit Company, Onondaga, N. Y.; Elbert A. Harvey, representing Lee, Higginson & Company, Boston, Mass., and Deforest Settle, of Bentley & Settle, Syracuse, N. Y. This committee, acting under a bondholders' protective agreement, is securing the deposit

of bonds with the Trust & Deposit Company, Onondaga, N. Y., and the Old Colony Trust Company, Boston, Mass. It is expected that this committee will have a very large voice in any reorganization plans which may finally be consummated.

C. D. Beebe, president, has issued the following statement regarding the future:

"The parties interested in the property expect to bring forward at a very early date a plan for the readjustment of the company's finances, which will probably mean some readjustment of the interest charges for a period on the Rochester, Syracuse & Eastern Railroad bonds and a change in the position of the Empire United Railways, Inc., first and refunding mortgage 5's. Moreover, a part of the plan will be to provide for the capital expenditures on the Rochester, Syracuse & Eastern Railroad that will be needed during the next eighteen or twenty-four months. The plan will also cover the same general line of capital expenditures on both the Lake Shore and the Auburn & Northern divisions."

The board of directors of the company was recently reduced from fifteen members to nine members in order to expedite the transaction of business. The new board consists of H. S. Holden, W. A. Holden, E. I. Edgcomb, C. D. Beebe, Joshua Bachman, Lewis P. Smith and William Nottingham, Syracuse, N. Y.; W. O. Morgan, New York, and F. W. Roebing, Jr., Trenton, N. J.

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—The Arkansas Valley Railway, Light & Power Company recently retired \$50,000 of first mortgage sinking-fund gold bonds of the Pueblo & Suburban Traction & Lighting Company, purchase having been made through the International Trust Company, Denver, trustee.

Atlantic Shore Railway, Kennebunk, Me.—Frederick O. Conant and C. Southworth, respectively president and treasurer of the Atlantic Shore Railway, were on Nov. 1 appointed receivers of the company by the United States Circuit Court in Portland. The appointment was made in response to a bill in equity filed by the Consolidated Coal Company as a creditor. Shortly before the court proceedings the directors voted not to oppose the suit. In court they admitted the allegation in the bill and asked to be permitted to join in the suit. The financial condition of the company was briefly described in the ELECTRIC RAILWAY JOURNAL of Nov. 6 in connection with an Oct. 1 bond interest default.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—At the receiver's sale of the Birmingham, Ensley & Bessemer Railroad, on Oct. 28, the property was purchased for \$700,000 by J. D. Kirkpatrick, representing the bondholders' committee. Steps will be taken to carry out at once the plan for reorganization, as described in the ELECTRIC RAILWAY JOURNAL of Oct. 2. As soon as the sale has been approved by the court, the new company will take over the property.

Boston (Mass.) Elevated Railway.—A bond issue of \$3,286,000 was authorized by the stockholders of the Boston Elevated Railway at the annual meeting on Nov. 1. The bonds, if approved by the Public Service Commission, will be used for the partial funding of the floating debt, construction, equipment, etc., as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 30 in connection with the application to the commission.

Buffalo & Niagara Falls Electric Railway, Buffalo, N. Y.—Sealed proposals will be received on Nov. 15 by the Bankers' Trust Company, New York, for the purchase of \$10,000 of second mortgage sinking-fund gold bonds of the Buffalo & Niagara Falls Electric Railway, dated July 1, 1896. No tenders at a rate exceeding 105 per cent and accrued interest from the last interest date will be accepted. This is one of the companies now included in the system of the International Railway.

Croyden (England) Corporation Tramways.—The traffic receipts of the Croyden Corporation Tramways for the fiscal year ended March 31, 1915, amounted to £87,833, and the total revenue to £88,614. The working expenses totaled £70,307 and the war allowances £1,974, leaving a credit balance of £16,332. After deductions for income tax,

interest and sinking fund there remained a net balance of £190, which was carried to the renewals fund. From April 1 to July 31, 1914, the traffic receipts increased £2,382; while the net increase during the last eight months amounted to only £525 on account of the war. The combined increases, however, represented 3.42 per cent. Passengers carried increased 619,524 or 3.22 per cent, working expenses £564 or 0.81 per cent. and miles run 2497 or 0.09 per cent.

Manaos (Brazil) Tramways & Light Company.—The report for the year ended April 30, 1915, states that the gross receipts of the Manaos Tramways & Light Company amounted to £110,420, a decrease of £22,457. The expenses were £84,240, a decrease of £12,608, and the net earnings £26,180, a decrease of £9,848. The fall in exchange resulted in a loss of £6,180 on remittances during the year. After providing for interest, London charges, etc., placing £1,725 to debenture sinking fund and £300 to depreciation on furniture, there remained a profit balance of £4,002 to be carried forward. The state, federal and municipal governments are still in arrears with their accounts, although as a result of strenuous efforts some collections were made during the year.

Memphis (Tenn.) Street Railway.—Bertron, Griscom & Company, New York, have completed arrangements to pay \$1,000,000 of 6 per cent two-year debenture notes of the Memphis Street Railway, due on Nov. 1. The payment will be made from part of the proceeds of \$1,500,000 of 6 per cent two-year collateral gold notes recently sold, as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 9.

Merrill Railway & Lighting Company, Merrill, Wis.—It was announced in the ELECTRIC RAILWAY JOURNAL of July 24 that the Merrill Railway & Lighting Company had decided to surrender its franchise and vacate the streets. This action was decided upon because the Council insisted that the company, instead of laying its track in concrete, should pave between the tracks with brick, which would necessitate taking up and relaying all track besides paving it and would involve a cost of \$3 per foot. When the company announced the suspension of service, however, the newspapers and business men took a hand and the Council by a fifteen to one vote decided to allow the use of concrete between the tracks, which lessened the cost to \$1 per foot. The question has now been adjusted to the satisfaction of all parties without a franchise surrender.

Minneapolis & Northern Railway, Minneapolis, Minn.—Judge William E. Hale of the District Court for the Fourth Judicial District of Minnesota on Nov. 6 filed an order requiring F. H. Hunter, receiver Minneapolis & Northern Railway, and all creditors of this company to show cause at a hearing on Nov. 13 why an order of the court requiring the receiver to wind up his affairs and execute a deed of conveyance of the property to the Minneapolis, Anoka & Cayuna Range Railroad should not be entered as a final decree. This action is taken on the application of Charles P. Bratnober, one of the trustees who came into possession of the property by foreclosure. The formation of the Minneapolis, Anoka & Cayuna Range Railroad to take over the property from the trustees was described in the ELECTRIC RAILWAY JOURNAL of Aug. 14.

Northern Electric Railway, Chico, Cal.—The Northern Electric Railway and its allied companies have filed an application with the California Railroad Commission for the approval of the proposed reorganization plan, which was described in the ELECTRIC RAILWAY JOURNAL of Oct. 23.

Otsego & Herkimer Railroad, Cooperstown, N. Y.—The receivership of the Otsego & Herkimer Railroad under C. H. Lewis and James J. Byard, whose appointment was mentioned in the ELECTRIC RAILWAY JOURNAL of Sept. 4, was recently terminated by Judge Ray as a result of an application by the Equitable Trust Company, New York, which had purchased the bonds and stock of the company and taken assignments of all the outstanding indebtedness of general creditors.

Portland (Me.) Railroad.—Upon the application of the Portland Railroad the Maine Public Utilities Commission has authorized the company to mortgage its properties to the New York Trust Company to secure \$7,500,000 of bonds, the mortgage to be dated as of Nov. 1, 1915, and due on

Nov. 1, 1915. The company may deposit with the trustee as additional security for indebtedness, now or hereafter, secured by mortgage, its first consolidated mortgage gold bonds, dated July 1, 1901, and due on Jan. 1, 1951. The commission also authorized the company to issue at not less than 90 and accrued interest \$1,000,000 of 5 per cent first lien and consolidated gold bonds, the proceeds thereof to be applied to the discharge of \$500,000 of Portland Railway extended first mortgage 5 per cent bonds due on Nov. 1, 1915, and of \$400,000 of Portland & Cape Elizabeth Railway first mortgage bonds, due on Nov. 1, 1915. A syndicate of bankers composed of A. B. Leach & Company, Charles H. Gilman & Company, Maynard S. Bird & Company, Merrill Trust Company and Fidelity Trust Company has already sold this entire \$1,000,000 issue at 97 and interest. These bonds are callable at 105 on any interest day.

Portsmouth (N. H.) Electric Railway.—President Huestis of the Boston & Maine Railroad has notified the Citizens' Railway, Portsmouth, that the Boston & Maine Railroad will give up the operation of the Portsmouth and Greenland line at once, the lease with the road having expired. The road has been operated in connection with the Portsmouth Electric Railway, which is owned by the Boston & Maine Railroad.

San Diego & South Eastern Railway, San Diego, Cal.—The California Railroad Commission recently issued an order authorizing the San Diego & South Eastern Railway to issue a two-year promissory note of \$25,000 to the First National Bank, San Diego, interest not to be more than 6 per cent. This note refunds a similar one issued without authorization by the commission.

Southern Iowa Railway & Light Company, Albia, Iowa.—It is reported that Judge Hunter has ordered the sale of the Southern Iowa Railway & Light Company property. Stockholders have protested and may carry the case higher. A note of the appointment of a receiver for this company was made in the *ELECTRIC RAILWAY JOURNAL* of June 26.

Utah Securities Corporation, New York, N. Y.—The Utah Securities Corporation, through the \$500,000 available for the retirement of its ten-year 6 per cent notes, has purchased \$578,000 of the issue at an average price of 85½ and interest. Similar purchases previously made were described in the *ELECTRIC RAILWAY JOURNAL*, issues of March 6 and 20.

Washington-Oregon Corporation, Vancouver, Wash.—The sale of the properties of the Washington-Oregon Corporation, under foreclosure, to Harry N. Putnam, Portland, was effected on Oct. 30. The sale was conducted by Major Charles O. Bates, Tacoma, as special master in chancery. The purchase price offered by Mr. Putnam was \$1,569,000. Mr. Putnam deposited with the special master a certified check for \$35,000 to bind the sale. In consideration of the transfer of the properties of the Washington-Oregon Corporation by Mr. Putnam to the North Coast Power Company, that company will issue to Mr. Putnam all of its preferred and common stock, aggregating in par value \$1,750,000, and bonds of the face value of \$675,000. Mr. Putnam will turn over the securities so received from the North Coast Power Company for distribution among the bondholders of the Washington-Oregon Corporation. Referring to the option given by the reorganization agreement to unsecured creditors and second-mortgage bondholders, Mr. Childs, who represents the reorganization committee, said: "The bondholders are willing to let the unsecured creditors and the second-mortgage bondholders take over the property and business of the new company, provided the investment of the first-mortgage bondholders is made good to them. We think it is fair to give the creditors any value there is in the property over and above the amount which has been invested by the bondholders. The North Coast Power Company is not controlled by the stockholders or officers of the Washington-Oregon Corporation, but is organized by the secured creditors of the corporation. The management and policies of the new company will be in the hands of entirely new interests. Herbert L. Harries, who is now managing the properties for the receiver, will be general manager of the North Coast Power Company. The company expects to take over the properties of the Washington-Oregon Corporation about the middle of November."

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., quarterly, 1 per cent, common.
 Bristol & Plainville Tramway, Bristol, Conn., quarterly, 2 per cent.
 Central Arkansas Railway & Light Corporation, Hot Springs, Ark., quarterly, 1½ per cent, preferred.
 Detroit (Mich.) United Railway, quarterly, 1½ per cent.
 Illinois Traction System, Peoria, Ill., quarterly, three-fourths of 1 per cent, common.
 Massachusetts Consolidated Railways, Greenfield, Mass., 1½ per cent, preferred.
 Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, original preferred and first preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, SANFORD, ME.						
Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income	
1m., Sept., '15	\$35,132	\$22,261	\$12,871	\$611	\$12,260	
1 " " '14	36,181	25,031	11,150	631	10,519	
AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.						
1m., Sept., '15	\$168,333	\$111,061	\$57,272	\$45,319	\$11,953	
1 " " '14	183,355	119,860	63,495	43,638	19,857	
3 " " '15	545,797	344,646	201,151	135,485	65,666	
3 " " '14	611,209	360,697	250,512	131,360	119,152	
CAPE BRETON ELECTRIC COMPANY, SYDNEY, CANADA						
1m., Aug., '15	\$33,226	*\$18,160	\$15,066	\$6,603	\$8,463	
1 " " '14	32,742	*17,485	15,257	6,407	8,850	
12 " " '15	338,506	*206,902	131,604	78,999	52,605	
12 " " '14	371,858	*209,574	162,284	75,903	86,381	
CITIES SERVICE COMPANY, NEW YORK, N. Y.						
1m., Sept., '15	\$349,456	\$14,301	\$335,155	\$40,833	\$294,322	
1 " " '14	279,413	10,577	268,836	40,833	228,003	
12 " " '15	4,121,622	159,571	3,962,051	490,000	3,472,051	
12 " " '14	3,803,196	101,424	3,701,772	371,662	3,330,110	
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO						
1m., Sept., '15	\$39,250	*\$19,690	\$19,560	\$10,973	\$8,587	
1 " " '14	39,933	*21,031	18,902	10,746	8,156	
9 " " '15	307,096	*168,018	139,078	98,758	40,320	
9 " " '14	316,074	*168,151	147,913	99,162	48,751	
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO						
1m., Sept., '15	\$109,292	*\$71,101	\$38,191	\$27,458	\$10,825	
1 " " '14	113,019	*69,941	43,078	27,343	15,735	
9 " " '15	920,132	*619,555	300,577	247,461	54,000	
9 " " '14	950,590	*613,018	337,622	245,978	\$91,644	
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Aug., '15	\$56,000	*\$25,760	\$30,240	\$28,679	\$1,561	
1 " " '14	54,600	*23,985	30,615	28,791	1,824	
12 " " '15	701,436	*321,247	380,189	345,001	35,188	
12 " " '14	655,653	*277,119	378,534	309,114	69,420	
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Aug., '15	\$55,065	*\$29,324	\$25,741	\$8,930	\$16,811	
1 " " '14	61,088	*33,858	27,230	8,802	18,428	
12 " " '15	670,497	*378,939	291,558	104,831	186,727	
12 " " '14	635,869	*394,772	241,097	100,029	\$155,938	
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Aug., '15	\$75,111	*\$42,680	\$32,431	\$4,203	\$28,228	
1 " " '14	86,432	*51,225	35,207	4,178	31,029	
12 " " '15	979,878	*527,609	452,269	50,861	401,908	
12 " " '14	1,002,403	*559,617	442,786	51,330	\$391,524	
JACKSONVILLE (FLA.) TRACTION COMPANY						
1m., Aug., '15	\$47,613	*\$35,435	\$12,178	\$14,602	†\$2,424	
1 " " '14	55,797	*33,689	17,108	12,475	4,633	
12 " " '15	629,754	*441,862	187,892	170,292	17,600	
12 " " '14	731,660	*468,982	262,678	153,103	109,175	
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO						
1m., Sept., '15	\$126,284	*\$75,711	\$49,573	\$35,127	\$13,446	
1 " " '14	132,502	*78,521	54,081	35,804	18,277	
9 " " '15	1,032,334	*671,143	361,191	324,833	35,358	
9 " " '14	1,098,927	*673,882	425,045	319,237	105,808	
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.						
1m., Aug., '15	\$23,550	*\$14,253	\$9,297	\$7,534	\$1,763	
1 " " '14	24,804	*15,750	9,054	7,505	1,549	
12 " " '15	290,205	*182,704	107,501	91,836	15,665	
12 " " '14	306,771	*196,672	110,099	91,470	18,629	
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.						
1m., Sept., '15	\$816,124	\$502,569	\$313,555	\$133,751	†\$181,603	
1 " " '14	803,495	471,512	331,983	138,552	†205,391	
9 " " '15	6,996,426	4,531,392	2,465,034	1,211,105	†1,272,360	
9 " " '14	6,936,839	4,316,299	2,620,540	1,176,503	†1,453,228	

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

Traffic and Transportation

JITNEY JOTTINGS

Philadelphia Ordinance Sustained—The Case Against the Jitney in Atlantic City

In an opinion filed on Nov. 4 Judge Patterson, in Common Pleas Court No. 1 at Philadelphia, Pa., dismissed the suit of the jitney men for an injunction restraining the Mayor and Director of Public Safety from enforcing the jitney ordinance. He found that the evidence offered by the complainants failed to establish that the ordinance is unconstitutional, unreasonable, oppressive, prohibitive, discriminatory, confiscatory, or that it conflicts with any existing law. Judge Patterson finds in his conclusions of law that the city, in granting permission for the operation of motor buses in the streets, may by ordinance impose conditions under which such rights may be enjoyed. It may require the owners or lessees of such buses to charge a certain designated maximum rate of fare and to fix maximum lengths of routes, and to require such vehicles to travel the full distance of such routes before returning to the starting point. Judge Patterson quotes from decisions of the Supreme Court of California and the Federal Court in Tennessee. In conclusion he says: "It is well settled, of course, that an ordinance, even when passed pursuant to legislative authority, must be a reasonable exercise of the power conferred by the Legislature, or it will be pronounced invalid. But in considering this question, it is well to remember that the complainants in this case have no vested right in the use of the streets for operating vehicles for hire. No person or persons can acquire the right to haul passengers for hire over the streets or to make any other special or unusual use of the public highways except by grant from the sovereign power. The responsibility in dealing with this question rests with Councils, and not with the courts. Councils have been given ample authority by the Legislature to pass ordinances regulating motor buses in the city streets."

This decision is regarded as dropping the final curtain on the jitney fight in Philadelphia. Unless appeals are taken to the Supreme Court, which is regarded as exceedingly unlikely, particularly as jitney competition has almost ceased to exist for some time, the decision finally disposes of the plans of the jitney drivers to prevent the enforcement of the Broad Street zone provision of the ordinance. The suits were based upon the complaint that the ordinance was prohibitive, as the jitney buses could not be run at a profit at a 5-cent fare over the route prescribed.

At a meeting held in Atlantic City, N. J., to discuss the jitney question and its effect on the investment of the Atlantic City & Shore Railway, a resolution was adopted calling upon the City Commission to pass an ordinance barring the jitney operators from Atlantic Avenue and other streets covered by franchises to the electric railways and requiring the jitneys to furnish a bond of \$2,500 each. Isaac H. Silverman, president of the railway, said that the corporation had suffered a loss of \$80,000 during the last summer and faced a receivership. H. E. Kohn, of Bachman & Company, Philadelphia, financial agents of the company, said the company was being subjected to a guerilla warfare, which threatened to become ruinous to many investors. Albert T. Bell expressed the belief that the company could solve its problem by adopting the zone system of fares for Atlantic Avenue. Charles Evens, vice-president of the company, said that every dollar the city derived from jitneys was spent in employing policemen to keep them from killing people. Ex-Judge Allen B. Endicott, a bank president, insisted that the city protect residents who have invested their money in the electric railway and the banks which hold its securities. William F. Hanstein, president of the Hotelmen's Association, proposed that jitneys be excluded from Atlantic Avenue. Joseph A. McNamee, a banker, said that a receivership for the company would depreciate every investment in Atlantic City 25 per cent and set back lower resorts ten years. The jitney men are supported by Mayor Riddle and one or two of the newspapers, while most of the city commissioners are silent on the subject.

CONFERENCE ON AUTOMOBILE ACCIDENTS

Meeting at Syracuse Results in Appointment of Committees —Another Meeting in Albany on Nov. 17

The increasing number of automobile accidents occurring at grade crossings, especially on electric railroads, has been the subject of consideration on the part of the Public Service Commission for the Second District of New York. To facilitate its work in this direction the commission deemed it advisable to solicit the co-operation of organized automobile people, and a communication was accordingly addressed to the presidents of the New York State Automobile Association and the Motor Federation, copies being sent also to each automobile club in the district within the jurisdiction of the commission. This communication contained an invitation to these State organizations and affiliated clubs to meet with representatives of the electric railroads in the Onondaga Hotel, Syracuse, on Oct. 27, at 10 a. m. to discuss before the Public Service Commission matters affecting safety of operation at grade crossings of electric railroads.

Suggestions favoring both mechanical and educational methods for preventing accidents, coming from more than fifty sources and freely discussed by ninety persons at the meeting, will be considered by a committee of nine to be appointed by the Public Service Commission. A resolution adopted at the meeting provides that this committee, with the aid of sub-committees which it will appoint, make a thorough study of the grade crossing situation and prepare suggestions of ways and means for the eliminations of such hazards as now exist. Other than the resolution asking the appointment of this committee no action was taken by the conference. Following the moving of this question the meeting spent the time listening to suggestions.

The representatives of the railway companies present advocated education as the method of lessening the casualties. The automobile men were more or less insistent that mechanical means be devised to inform the motorist that danger is near when railroad and railway crossings are approached. Both forces, however, agreed that publicity emanating from both railway and automobile sources and promulgated through the press, direct correspondence with automobile owners and through the publications of automobile clubs, possesses the greatest possibilities as a cure for the evils. It was agreed that a uniform system of signs notifying motorists of their approach to a crossing is an essential detail needing immediate attention. In discussing the matter of signs, J. P. Barnes, general manager Buffalo, Lockport & Rochester Railway, recommended that they be not regarded as danger signs, but rather as safety signs. He said the word "danger" to a certain class of motorists invited taking a chance.

Chairman Van Santvoord of the commission on Nov. 8 appointed the executive committee to consider means for greater safety at the grade crossings of electric railways in New York State, and a meeting of the committee has been called for Nov. 17, at the offices of the commission. The members of the committee are as follows: Peter G. Ten Eyck, Albany, representing the New York State Automobile Association; John B. McNerny, Rochester, representing the New York State Motor Federation; George C. Diehl, Buffalo, representing the American Automobile Association; E. G. Connette, Buffalo, president of the International Railway; B. E. Tilton, Utica, general manager of the New York State Railways; J. P. Barnes, Rochester, general manager of the Buffalo, Lockport & Rochester Railway; Mr. Van Santvoord, Francis M. Hugo, Secretary of State, and Edwin Duffey, State Commissioner of Highways as ex-officio members, and Charles R. Barnes, electric railway inspector of the Second District Public Service Commission, representing the commission.

At the meeting to be held in Albany sub-committees will be appointed to study the various suggestions for safer grade crossings of electric railways, which were submitted by the commission to the Syracuse conference and by many other persons in attendance at that conference. The reports of these sub-committees will be passed upon at a future meeting of the executive committee and the result will be embodied in a report to be submitted to the Public Service Commission.

TORONTO RUNNING BOARD CASE DECIDED IN COMPANY'S FAVOR

The Ontario Railway Board on Nov. 2 issued an order, on the application of the Toronto (Ont.) Railway, relieving it from responsibility for the operation of cars with running boards. Vice-Chairman Ingram and Commissioner Kittson heard the argument and adjourned the hearing *sine die*. Two hours later they issued the order desired by the company in the following terms:

"Upon hearing the counsel for the applicants and respondents and the board having been investigating the question of the change of the type of summer cars in use on the applicant's railway, and having conducted experiments and inspected the tracks and devil-strips of the said railway company's system, and the board being of the opinion that the space between the tracks, commonly called the devil-strip, is not sufficiently wide to permit cars with seats for passengers facing the front with an aisle sufficiently wide to allow the passage of the conductor, the board orders that the applicants be hereby relieved until a final disposition of this application from the obligation imposed by Sub-Section 1, of Section 107, Ontario railway act, to all routes upon which the company operates its street cars."

New Working Agreement in Fort Smith.—The Fort Smith Light & Traction Company, Fort Smith, Ark., has entered into a new contract with its men which runs until Nov. 1, 1916. Under the new contract the present length of the working day and working conditions other than those of wages remain unchanged. The pay of the trainmen, however, is increased 2 cents an hour.

Detroit Patrons Urged to Consider Skip Stops.—The Detroit (Mich.) United Railway, in *Electric Railway Service* for Nov. 5, urged upon its patrons their consideration of the skip stop. The company has asked its riders and readers to let it hear from them as to their opinion of the skip stop. In conclusion the company said: "The discussion will result in good to all of us, and it may lead to the adoption of some plan which will help materially in the transportation of the public."

Trenton Fare Hearing.—The hearing in regard to fares on the lines of the Trenton & Mercer County Traction Corporation, Trenton, N. J., was resumed on Oct. 29. Three reasons were assigned by Rankin Johnson, president of the corporation, as to why the receipts of the company have decreased in the present fiscal year from the total receipts for the same months of 1914. The first reason was the increase in the use of automobiles. The second was the development of the commercial automobile, known as the jitney. The third was the general depression.

How the Louisville Nickel Is Divided.—Passengers on the cars of the Louisville (Ky.) Railway are getting their first lessons in the interdependence of themselves and the company. This is a part of the campaign which the ELECTRIC RAILWAY JOURNAL recently mentioned. It will be continued indefinitely. The first card read as follows: "How the trolley nickel is divided.—2.02 cents for wages. 0.78 cent for expenses. 0.55 cent for taxes. 1.06 cent for interest. 0.59 cent for dividend. Our interests are mutual.—Louisville Railway."

Skip Stops in Washington.—It is announced that the Washington Railway & Electric Company, Washington, D. C., is about to establish an express service from Fifteenth Street and New York Avenue to the District line at Chesapeake Junction, cars running every six minutes between 4 p. m. and 6 p. m. It is further stated that these cars will not take city passengers, and will stop only at indicated points on the road. These indicated points number twelve between Fifteenth Street West and Fifteenth Street East, being the compulsory stops at track intersections and "fire stops."

New Express Rates of Northern Texas Traction Company.—The Northern Texas Traction Company, Fort Worth, Tex., has put into effect a new schedule of express rates over its line extending from Dallas to Fort Worth and Fort Worth to Cleburne, which reduces by approximately one-half the rates charged under the old classification of "merchandise"

or "general specials." The Texas Railroad Commission classification of first, second, third or fourth classes is used, and rates corresponding to these classes, the same as are charged by the steam railroads, are assessed, giving express service for freight rates.

San Francisco Municipal Railway's Largest Day.—Receipts from fares on the San Francisco (Cal.) Municipal Railway system on Nov. 2, San Francisco day at the exposition, were the largest in the history of the municipal line. The total cash fares on all branch lines amounted to \$14,007, eclipsing by several hundred dollars the receipts on opening day. The exposition attendance on Nov. 2 was about 348,000. It is estimated that more than 280,000 persons rode on the city car lines. No accidents were reported. The total receipts of the municipal line from all sources during October were \$215,231.15.

Increase in Wages on Massachusetts Line.—The conductors and motormen in the employ of the Boston & Worcester Street Railway, Boston, Mass., have been granted an increase in wages. The new schedule provides that the men will receive a minimum of 26 cents an hour and a maximum of 32 cents. The old rates called for a minimum of 24 cents and a maximum of 29 cents. The men who have been employed by the company six months or less get 26 cents under the new rate. The second six months the wage is advanced to 27 cents. The wage for the second-year men is to be 28 cents and the third-year men 29 cents. The fourth-year men will receive 30 cents and after this period of service all the uniformed employees will receive the maximum of 32 cents.

New Regulations for Safety in Streets.—Many important recommendations to provide for new traffic regulations with the view to minimizing the number of accidents occurring upon the public streets were approved at a meeting of the street traffic committee of the New York Safety First Society held on Nov. 4. It was the consensus of opinion that the campaign of education being conducted by the Safety First Society was accomplishing much good, but that greater authority must be given to the traffic police to regulate and direct pedestrian travel upon the public streets and that it should be unlawful for any person to cross a street in the middle of a block. The Detroit ordinance, which gives the police commissioner power to regulate and direct the course of pedestrian travel, was approved. An important recommendation provides for an ordinance making it a misdemeanor for any person to "hitch on" or trespass upon a motor vehicle, street car or horse-drawn vehicle, unless employed by the owner thereof.

Accident Fakir Apprehended in New Jersey.—On Oct. 6, 1915, James Ryan, alias James Morris, alias Charles Miller, alias Harry Peterson, was arrested on complaint of Claim Agent Van Buskirk of the Central Division of the Public Service Railway, Newark, N. J., charged with attempting to obtain money under false pretences. He received a hearing before Recorder Feister of New Brunswick, pleaded not guilty and was held under bail to await the action of the Grand Jury. This man, giving a different name on each occasion, has presented four claims against the Public Service Railway in different parts of the State, and his attempts to collect at the same office twice led to his arrest. He invariably gives his occupation as that of a carpenter. In all of the cases his claim is based on a fall inside of a car. In each case he showed symptoms of a fractured skull and got away with it. His story has been that he fell as a result of tripping over a protruding nail in the car. He usually extracted this nail from his shoe in the presence of witnesses at the hospital. He appears to be about fifty years of age; height 5 ft. 9¼ in., weight 190 lb.; hair slightly gray; drooping gray moustache; eyes blue-gray. Ryan has now been positively identified as having made similar claims against the Connecticut Company, in which he used the name of Charles Miller; against the Fonda, Johnstown & Gloversville Railway, in which he used the name of Richard Boshart, and against the Worcester (Mass.) Consolidated Street Railway, in which he used the name of John Meyers. In all of these cases he deceived the examining physicians and the physicians at the hospital.

Personal Mention

Mr. Bury I. Dasent has been appointed publicity agent of the British Columbia Electric Railway, Vancouver, B. C., to succeed Mr. Frank Harris, resigned.

Mr. E. B. Heath, trainmaster for the Spokane, Portland & Seattle Railroad, Portland, Ore., has been appointed assistant superintendent of the Spokane & Inland Empire Railroad and the Spokane Traction Company, Spokane, Wash.

Mr. Walter N. Polakov has resigned as superintendent of power of the New York, New Haven & Hartford Railroad to engage in consulting practice. He had been in charge of the operation of the power plants of the New Haven for eighteen months.

Mr. A. S. Henry has been appointed superintendent of transportation of the Lockport division of the International Railway, Buffalo, N. Y., including the Lockport city lines and the Buffalo and Lockport branch. He was formerly superintendent of the Lockport division of the company.

Mr. Thomas W. Connette, son of Mr. E. G. Connette, president of the International Railway, Buffalo, N. Y., who has been assistant superintendent of transportation of the Buffalo city lines of the company, has been promoted to the position of superintendent of transportation of the Buffalo city lines.

Mr. Edward Schlant has been appointed to succeed Mr. Thomas W. Connette as assistant superintendent of the Buffalo city lines of the International Railway, Buffalo, N. Y. Mr. Schlant was formerly in charge of the Hertle and Forest stations, in which capacity he will be succeeded by Mr. A. H. Hock.

Mr. H. M. Wilson, vice-president of the McGraw Publishing Company, Inc., was struck by an automobile on Nov. 5, in Scarsdale, N. Y., while returning to his home in the evening. The automobile carried no front lights. Although thrown to the ground and severely wounded in the face, Mr. Wilson escaped other serious injury and is now doing as well as can be expected.

Mr. Paul Shoup, president of the Pacific Electric Railway, Los Angeles, Cal., addressed the Jovian League in that city recently. Mr. Shoup reviewed electric railway history in that State, covering some of the points brought out by him in his speech before the American Electric Railway Association in San Francisco, Cal. Out of twenty-two electric railways in California on which he had secured figures only one paid a dividend to stockholders last year.

Mr. E. H. Henning has been appointed superintendent of transportation of the lines of the International Railway, Buffalo, N. Y., radiating from Niagara Falls, including the Buffalo and Niagara Falls division, the Niagara Falls city lines, the Park and River division on the Canadian side of the Niagara Gorge and across the Suspension Bridge and the new fast line between Buffalo and Niagara Falls soon to be built. Mr. Henning was formerly superintendent of the interurban lines of the company.

Mr. Herbert L. Harries, who has been managing the properties of the Washington-Oregon Corporation, with headquarters at Vancouver, Wash., for the receivers, has been appointed general manager of the North Coast Power Company, the successor to the Washington-Oregon Corporation, the property of which was sold under foreclosure on Oct. 30. Mr. Harries became connected with the Washington-Oregon Corporation in May, 1915. Before that he was assistant operating superintendent of the General Hudson Gas & Electric Company, Poughkeepsie, N. Y., having been theretofore assistant general manager of the Louisville Gas & Electric Company, Louisville, Ky., of which his father, Gen. George H. Harries, is president.

Mr. George G. Yeomans has been appointed purchasing agent of the New York, New Haven & Hartford Railroad, New Haven, Conn., to succeed Mr. H. A. Fabian. Mr. Yeomans was graduated from Princeton in 1879, and after leaving college worked for about two years in the rail mills of the Philadelphia & Reading Coal & Iron Company. He

then became connected with the Chicago, Burlington & Quincy Railroad as a rail inspector on the staff of the purchasing agent. After two years in this work he took a clerkship in the department, and filled practically every position in the purchasing agent's office, finally being made purchasing agent, which position he held for seven years. He was in the service of the Chicago, Burlington & Quincy Railroad for twenty-three years, resigning to become assistant to President F. A. Delano of the Wabash Railroad. He held that position for six years, until the road went into the hands of receivers in 1911. Since then he has made a specialty of investigating methods of purchasing and handling supplies on various large roads.

Mr. C. L. Stone, who has been appointed second vice-president and general manager of the Otsego & Herkimer Railroad, Colliers Light, Heat & Power Company and the Hartwick Power Company, Cooperstown, N. Y., was formerly vice-president and general manager of the Manila Electric Railroad & Light Corporation, Manila, P. I. Mr. Stone was with the General Electric Company from 1898 to 1902, first in the testing department and later in the power and mining, the engineering and the commercial departments. From 1902 to 1904 he was assistant to the master mechanic of the St. Louis (Mo.) Transit Company. Since 1904 he has been connected with the J. G. White Management Corporation, New York City. He went to Manila for the J. G. White organization before the electric railroad and lighting property there began operation, and had charge of a considerable amount of construction work. Operation in Manila was started in 1905, and Mr. Stone was appointed electrical engineer of the property. Later he was made assistant general manager of the Manila Electric Railroad & Lighting Company, in which capacity he served for a period of five years. He was vice-president and general manager of the properties there for approximately two years prior to his departure from Manila.

Mr. George O. Nagle has resigned as second vice-president and general manager of the Wheeling (W. Va.) Traction Company and as president and general manager of

both the Pan Handle Traction Company and the Steubenville & Wheeling Traction Company, controlled by the Wheeling Traction Company. His resignation becomes effective on Dec. 1. Mr. Nagle has been with the properties in Wheeling as general manager since July, 1903. Mr. Nagle's incumbency at Wheeling has been marked by an immense amount of new construction work and reconstruction and witnessed the early restoration of the company to a place in public confidence which too few public utilities of



G. O. NAGLE

the kind enjoy. At no time in the twelve years of Mr. Nagle's work in Wheeling has labor trouble threatened. Mr. Nagle was for Wheeling first. He entered into all work for community betterment, became an influential member of the Board of Trade, entered the Playground Association and recently was appointed by Governor Hatfield of West Virginia to represent the State as a member of the Panama-Pacific Exposition Commission. The esteem in which Mr. Nagle was held is instanced by the following statement made by the Wheeling *Intelligencer*: "Probably no other man in Wheeling during the time Mr. Nagle has lived here has been more highly regarded or has made a more profound impression upon the community at large. As an employer of labor, as an enterprising and aggressive street railway manager, as a citizen interested in civic affairs, and in the welfare of the community in general, Mr. Nagle has taken leadership and filled a place that will be difficult for any other man to fill." Mr. Nagle was born in Milton, Pa., on Dec. 31, 1868. He received his early education in Lima, Ohio, and moved to Chicago in 1886. Shortly after

this he entered the employ of the Chicago, Burlington & Quincy Railroad, serving first in the ticket auditor's office and later in the general auditor's office. In February, 1891, he entered the employ of the Chicago (Ill.) City Railway as junior in the claim department. Six months later he was promoted to the position of private secretary to the superintendent, which place he held until appointed superintendent on Jan. 18, 1898. After Mr. Nagle resigned from the Chicago City Railway he became connected with Stone & Webster, Boston, Mass., taking the position of manager of the Savannah (Ga.) Electric Company, which controls the lighting and railway properties there. Mr. Nagle remained at Savannah for several years. Early in 1903 he retired from the management of the Savannah company to take charge of the Stone & Webster properties in the Southeast. In July of the same year he was appointed to the company at Wheeling.

Mr. Charles A. Call, general passenger and freight agent of the New York, Westchester & Boston Railway, New York, N. Y., has been appointed manager of the industrial bureau of the New York, New Haven & Hartford Railroad, to succeed Mr. W. H. Seeley, resigned. Mr. Call entered railroading in 1883, when he became connected with the New York & New England Railway in its passenger department. In 1898 he became passenger agent at Boston, Mass., and in 1905 was appointed general agent of the passenger department of the New York, New Haven & Hartford Railroad with offices in New York City. Mr. Call became general agent of the New Haven at Boston in 1908. He became general manager and freight agent of the New York, Westchester & Boston Railway in 1912.

Mr. Nelson H. Brown, who for the last two years has been superintendent of transportation of the Buffalo division of the International Railway, Buffalo, N. Y., has been promoted to the new position of general superintendent of transportation of the entire system of the International Railway, including the Buffalo, the Niagara Falls and the Lockport city lines, and the Buffalo and Niagara Falls, the Buffalo and Lockport, and the Park and River divisions. The appointment is effective on Nov. 15. Mr. Brown entered the railroad business with the New York Central Railroad in 1891, with the mechanical department. Later he was a fireman between Syracuse and Albany. He resigned from the New York Central in 1894 to become identified with the Consolidated Street Railway, Syracuse. During the year and a half following he was employed as a conductor, but in 1896 he became a motorman for the Syracuse company. In 1898 Mr. Brown was appointed cashier, a position which he held for a year, when he was promoted to inspector. About that time the various street railway properties operating in Syracuse were consolidated, and Mr. Brown was made an inspector with the newly organized company, known as the Syracuse Rapid Transit Company. He remained inspector until 1907, when he resigned to accept a position at Worcester, Mass., as general inspector for the Worcester Consolidated Street Railway. On Sept. 1 of that year he was appointed superintendent of the Worcester & Southbridge Street Railway, at Charlton City, Mass. After five years of service at Worcester, Mr. Brown resigned to accept a position with the Albany Southern Railroad, as superintendent, with headquarters at Rensselaer, N. Y. Early in 1913 Mr. Brown resigned from the Albany Southern Railroad to assume the position of assistant superintendent of transportation of the International Railway, Buffalo, N. Y., and continued in this capacity from Feb. 1 to June 1, when he was appointed to the position of superintendent of transportation of the Buffalo division, in charge of operation in the city of Buffalo and vicinity.



N. H. BROWN

Mr. Edward Dana, assistant superintendent of surface lines of the Boston (Mass.) Elevated Railway, has been appointed superintendent of the recently created department of traffic. In his new work Mr. Dana will have charge of the laying out of surface car service, routing and time-tables, and will co-operate with the superintendent of transportation in all matters relating to traffic. Mr. Dana was born at Bernardston, Mass., in 1886. He completed the academic course at Harvard College in three years and was graduated in 1907. He entered the employ of the Boston Elevated Railway in 1907 as a conductor, and rapidly rose through the transportation department to the assistant superintendency of



EDWARD DANA

the surface lines of the company. Mr. Dana is widely known as an expert in traffic problems and has contributed many valuable articles to the ELECTRIC RAILWAY JOURNAL upon the scientific aspects of car service.

OBITUARY

Carl Witt, storekeeper of the Union Traction Company of Indiana, Anderson, Ind., for the last three years, died suddenly on Nov. 2. He had previously been auditor of the Indianapolis, New Castle & Eastern Traction Company, now a part of the Union Traction system. Mr. Witt was thirty-four years old. He is survived by his widow.

William J. Smith, a street railway pioneer of Kansas City, Mo., died on Nov. 8, at his home in that city. Mr. Smith was born in New York. In 1882 when Kansas City had horse car lines Mr. Smith conceived the idea of building a cable railway, and built the Ninth Street incline, which carried cable cars to the old Union Depot. He later built the Troost Avenue and the Independence Avenue cable lines, and the Summit Street road. Mr. Smith sold his street railway properties to the Metropolitan Railway in 1895.

August J. Reglin, division superintendent of the United Railroads, San Francisco, Cal., was suddenly stricken with heart failure and died on Oct. 22. Mr. Reglin was born in Troy, N. Y., on July 19, 1874. He entered the employ of the Public Service Corporation, Newark, N. J., on July 5, 1895. He served on the platform for fourteen months, when he was promoted to night clerk. He rose steadily in the work, and was called to San Francisco by the late George F. Chapman, general manager of the United Railroads, and on Feb. 8, 1904, he assumed charge of the Twenty-fourth and Utah Division of the United Railroads.

P. A. B. Widener died at his home at Elkins Park, near Philadelphia, Pa., on Nov. 6. Mr. Widener had been ill for some time. He was eighty-one years old. For a third of a century Mr. Widener had been known primarily as a traction financier in Philadelphia, New York and other cities; but as he increased the great fortune based upon street railways, his interests multiplied and he became a director of many industrial corporations, steam railroads and gas and electric companies. Mr. Widener was born in Philadelphia on Nov. 13, 1834. Early in his business career Mr. Widener became associated with the late William L. Elkins. They pooled issues and obtained control of all the surface lines in Philadelphia. In 1886 Mr. Widener entered the New York traffic situation. With Mr. Elkins, Mr. William C. Whitney, Mr. Thomas Fortune Ryan and Mr. Peter Dolan he figured in Metropolitan Traction Company and later Metropolitan Street Railway finance. Mr. Widener stopped active work years ago and gradually shifted his business cares to the shoulders of his son. In 1910 Mr. Widener was still recorded as vice-president of the Cresson & Smithfield Coal Company, and director of the Allegheny Valley Railroad, American Tobacco Company and Union Traction Company, Philadelphia. Five years earlier he had sat on the boards of a score or more corporations.

Construction News

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

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

RECENT INCORPORATIONS

*Waukegan & Woodstock Traction Company, Waukegan, Ill.—Incorporated in Illinois to construct an interurban line between Waukegan and Woodstock. Capital stock, \$50,000. Incorporators: L. C. Roberts, C. A. Spenny, H. A. Hirst, Thomas Howorth, Michael Nelson, F. C. Nickels and F. E. Corliss, all of Chicago.

McComb & Magnolia Railway & Light Company, McComb, Miss.—Incorporated in Mississippi to construct a line in McComb and an interurban railway to Summit, Fernwood and Magnolia. Capital stock, \$500,000. Guy M. Walker, New York, president, and A. H. Jones, McComb, general manager. [Oct. 9, '15.]

*Kansas City & Tiffany Springs Railway, Kansas City, Mo.—Chartered in Missouri to construct a line from Kansas City to Tiffany Springs, 15 miles. Capital stock, \$500,000. Incorporators: T. N. Smith, Charles J. Smith, Bayless Steele and C. W. Chandler, Kansas City, Mo.; J. N. Baird and Henry G. Post, Kansas City, Kan., and Robert Engelman, Parkville, Mo.

*South Dakota Short Line Railway, Mitchell, S. D.—Incorporated in South Dakota to construct an electric railway from Mitchell to Pierre. Capital stock, \$2,000,000. G. W. Adams, Council Bluffs, Iowa, is interested.

FRANCHISES

Clarkston, Idaho.—The Lewiston-Clarkston Transit Company has received a franchise from the Council to construct an electric railway in Asotin County from the city limits of Clarkston on Sixth Street to Highland Street and on Highland Street to Thirteenth Street, 1¼ miles.

Henderson, Ky.—The Council of Henderson is considering the matter of renewing the franchise under which the Henderson Traction Company is operating in that city. The ordinance has been drawn for some time and provides that the company, in consideration of the extension of the franchise for twenty years, will make extensions of its lines and will pay an annual franchise fee.

Millersburg, Ohio.—The Dover, Millersburg & Western Railway recently received a twenty-year franchise from the Council to construct and operate an electric railway in Millersburg. The company has also been granted a franchise by the Holmes County Commissioners to build an electric railway in Holmes County to connect Millersburg with Sugar Creek and Canal Dover. [Sept. 18, '15.]

*Henryetta, Okla.—The Henryetta, Oklahoma & Western Railway has received a franchise from the Council to construct an electric railway in Henryetta. An election on the franchise will be held on Nov. 30.

Walkersville, Ont.—The Sandwich, Windsor & Amherstburg Railway was refused an extension of its franchise at a recent election in return for the construction of a belt line to serve the factory and residential districts.

Astoria, Ore.—The Pacific Power & Light Company has received a franchise from the Council to construct a line on Franklin Avenue, Astoria.

Tacoma, Wash.—The Tacoma Railway & Power Company has received a fifty-year franchise to construct a line from the Fort Steilacoom Insane Asylum to the town of Steilacoom, about 2 miles. The franchise provides that the road must be built in six months. The Council of Steilacoom has already granted the company a fifty-year franchise to operate on its streets.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—Preliminary to the construction of the \$12,000,000 subway to the beaches, this company will rearrange its tracks at the Hill Street station. The subway planned contemplates the construction of a tunnel under Olive Street, west of the sta-

tion, and when completed will be more than 6 miles long. The exact date when this work will begin has not been set, but the preliminary work on altering the tracks is to be begun at once. The rearrangement of the tracks at the Hill Street terminal will cost approximately \$40,000.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—It is reported that this company, which recently acquired the Wilmington, New Castle & Delaware City Railway, has ordered the equipment necessary to convert the road into an overhead trolley line. Work will be begun the latter part of November or early in December and it is expected that cars will be operated by overhead trolley before the first of next year. The line has heretofore been operated on the electric storage-battery system. The Orange Street line of this company between Sixth and Thirteenth Streets has been abandoned by the company following the recent changes in the routing of the cars of the company. The tracks of the line will be removed preparatory to repaving the street.

Georgia Railway & Power Company, Atlanta, Ga.—It is reported that this company is considering an extension from Atlanta to Alpharetta via Roswell or Crabapple.

Hawkinsville & Florida Southern Railway, Macon, Ga.—This company will operate a gas-electric car on its line and plans to inaugurate double daily passenger schedules. Another gas-electric car will soon be placed in service as a substitute to a steam train.

Joliet & Eastern Traction Company, Joliet, Ill.—Plans are being considered by this company to extend its line from Chicago Heights, Ill., to Hammond, Ind.

Kankakee & Urbana Traction Company, Urbana, Ill.—This company has about completed concrete abutments for a new bridge to be erected on its extension from Ludlow to Paxton. The grading has been completed almost to Paxton. Rail-laying will be begun within the next week.

Fert Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—This company has entered into a contract with the Battleground Light & Power Company to furnish that company with light and power for twenty-five years. The current will be taken from the high-tension wires at Buck Creek. The Battleground Light & Power Company will build the line between the two places.

Mattawamkeag & Northern Railway, Bangor, Me.—It is reported that financial arrangements have been completed for the construction of the Mattawamkeag & Northern Railway from Mattawamkeag to Millinocket and East Millinocket, 23 miles, under a charter held by Charles W. Mullen, Bangor, a member of the Main Public Utilities Commission; I. B. Wood, Bangor; Artemas Weatherbee, Lincoln, and Frank J. Rich, Mattawamkeag. Stone & Webster of Boston are the fiscal agents, and a survey has been made under the direction of that concern. [Nov. 14, '14.]

Winnipeg (Man.) Electric Railway.—The public utilities commissioner has issued an order directing this company to proceed immediately with the construction of a double-track extension on Watt Street, Elmwood.

Bay State Street Railway, Boston, Mass.—Work has been begun by this company extending its double track in Methuen. The new line will extend from the present terminus at the corner of Hampshire, High and Lowell Streets to Railroad Square on the east side of the tracks of the Massachusetts Northeastern Street Railway. The company will repair its tracks on Montello Street between Plain Street and Perkins Avenue, Brockton.

Milford & Uxbridge Street Railway, Milford, Mass.—Work has been begun by this company repairing its trestle bridge on Medway Road. Granite supports and foundation will be substituted for the timber now being used. It is expected that work will be completed within a month.

McComb & Magnolia Railway & Light Company, McComb, Miss.—This company has taken over the plant and equipment of the McComb City Electric Light & Power Company and will begin at once the preliminary surveys for its line in McComb and the interurban lines to Summit, Fernwood and Magnolia. X. A. Kramer, Magnolia, will construct the lines and additional power plants. A. H. Jones, McComb, general manager. [Oct. 9, '15.]

Metropolitan Street Railway, Kansas City, Mo.—Work has been begun by this company on the construction of the double-track extension of its Thirty-first Street line from Indiana Avenue to Brighton Avenue.

Niagara River & Eastern Railway, Niagara Falls, N. Y.—The Public Service Commission for the Second District of New York has received final briefs in the petition of this company for permission to build and operate a double-track line for passenger and freight service between Lockport and Niagara Falls. The Niagara River & Eastern Railway proposes to connect with the International Railway and Buffalo, Lockport & Rochester Railway at Lockport and with trunk lines of steam railroads in Canada by a new bridge across the river at Lewiston. It is also proposed to handle freight on the Buffalo, Lockport & Rochester Railway and have connections with the Erie Railroad and Pennsylvania Railroad at Rochester. Charles Hickey, Lockport, president. [July 31, '15.]

Oakwood Railroad, Dayton, Ohio.—This company is building an extension of its line along the Lebanon Pike and Patterson Road for a distance of about a mile, and it is expected that operation will be begun about Dec. 1. The estimated cost of the improvement is approximately \$60,000.

Tiffin, Ohio.—It is reported that forty miles of right-of-way have been purchased for the proposed railway between Tiffin, Bucyrus and Fremont. Contracts for the Tiffin-Fremont section of the line are to be let within two months. Entrance into Toledo from Fremont is proposed over a leased line. A. W. Nyquist, Tiffin, is interested. [Sept. 18, '15.]

***Henryetta, Okla.**—It is reported that plans are being considered by R. D. Long, Muskogee, to construct an electric railway from Henryetta to several small towns.

Oklahoma & Interstate Railway, Oklahoma City, Okla.—At a special meeting of the Council of Galena a resolution was passed calling for an election on Nov. 23 for the purpose of voting on a bond issue not to exceed \$15,000 to aid in the construction of this company's line from Columbus and Baxter Springs to Galena. [Oct. 23, '15.]

Sapulpa & Oil Field Railway, Tulsa, Okla.—Work will be begun by this company some time this month on its proposed line from Drumright to some point on the St. Louis & San Francisco Railroad. As published in the *ELECTRIC RAILWAY JOURNAL* for Oct. 30, J. A. Frates has been elected president of the company and C. F. Hopkins vice-president and general manager. The following directors were elected: J. A. Frates, St. Louis; Frank Brown, Independence, Kan.; C. F. Hopkins, Sapulpa; S. W. Barns, Kansas City; W. A. Moore; J. T. Langtry, Sapulpa, and J. H. Grant, Oklahoma City. The headquarters of the road will be at Tulsa, where offices have been established. An electric locomotive will handle the regular freight cars and the rails will be standard gage. Two electric cars, with a capacity of forty-four persons, and one electric locomotive have been ordered for the preliminary business.

Mimico, Ont.—Presenting the views of Mimico, Reeve Coxhead at a joint meeting of the various municipalities interested in the proposed Toronto to London hydro-electric railway, urged that the Ontario Hydro-Electric Commission appropriate the present line of the Toronto & York Radial Railway from the Humber River through Etobicoke Township. It was stated that plans have already been prepared to be submitted to the Toronto and Hamilton Highway Commission for the widening of the Lake Shore road to 86 ft. to give ample space for the double-tracking of the line. If taken over the line could be put in a condition measuring up to the standard of the other commission-owned lines throughout the province and thereby the conflict of service could be avoided.

Toronto (Ont.) Railway.—This company has placed in operation the extension of its Harbord Street line in conformity with the order of the Ontario Railway & Municipal Board. Some time ago the city laid tracks on Ossington Avenue, north from Bloor Street to Hallam Street, west on Hallam Street to Dufferin Street, north on Dufferin Street to Lappin Avenue and west on Lappin Avenue to Lansdown Avenue. The cars on the Harbord Street line will now

operate over the new route. The extension is about 1¼ miles.

Portland & Oregon City Railway, Portland, Ore.—This company has purchased the right-of-way through the tract owned by the Multnomah Mohair Mill Company in Sellwood near Willsburg. This practically gives the company right-of-way from Milwaukie to Portland. Track has been laid through Milwaukie from the south side along the east side of the Crystal Lake Park. South from Milwaukie track has been laid nearly to Bakers Bridge over the Clackamas River. The company is working from Milwaukie toward Portland. [May 1, '15.]

***Ballinger, Tex.**—Business men of Ballinger and Abilene are contemplating the construction of an electric railway to connect the two cities. The present steam railroad is considered inadequate for the traffic.

Petersburg & Appomattox Railway, Petersburg, Va.—Following a conference in Richmond recently between the officials of the Petersburg & Appomattox Railway and the Virginia Railway & Power Company, it was announced that an agreement had been entered into whereby the Virginia Railway & Power Company will furnish to the Petersburg & Appomattox Company current for the operation of its cars between Petersburg and City Point. An agreement was also entered into whereby the Petersburg & Appomattox Company will use the tracks of the Virginia Railway & Power Company from Wythe and Main streets, the terminus of the former company, to the office of the latter company at Bollingbrook and Sycamore Street. The company is rapidly pushing the construction of its line between Petersburg and Hopewell to completion, and it is expected that the road will be in operation to Hopewell on or before Jan. 1. [Oct. 16, '15.]

Washington-Oregon Corporation, Vancouver, Wash.—The light and power properties of the Washington-Oregon Corporation have been purchased by Harry N. Putnam, Portland.

Charleston (W. Va.) Interurban Railroad.—Operation has been begun by this company on its line between Charleston and Marmet, 10 miles. The line will be extended to Montgomery.

Chicago & Wisconsin Valley Railroad, Madison, Wis.—At a recent meeting of the stockholders of this company resolutions were adopted changing the name of the company to the Wisconsin Interurban System. It was also decided to amend the charter, extending the line west from Sauk City and Prairie du Sac to Viroqua and northeast from Madison to Fond du Lac. It is proposed to begin construction next spring. [Oct. 30, '15.]

SHOPS AND BUILDINGS

Tri-City Railway of Illinois, Rock Island, Ill.—This company plans to construct a street car terminal at Watch Tower Park on the site of the old roller skating rink, which has been torn down.

Metropolitan Street Railway, Kansas City, Mo.—Members of the board of control of this company have approved the plans for an ornamental shelter house 48 ft. x 12 ft. to be constructed on the east side of the tracks south of the Main Street viaduct for persons waiting for cars at the Union Station. The ends will be of cement, the sides of glass and the roof of Spanish tile. It is to contain no benches or concessions, but will be only a shelter from the wind and rain.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—Arrangements have been completed whereby this company and the Salt Lake & Ogden Railway will acquire the corner on South Temple and West Temple Streets for a new interurban terminal. The property is to be given to the interurban lines by the Mormon Church authorities and property owners of upper Main Street. The property has a frontage of about 200 ft. on West Temple Street and 330 ft. on South Temple Street. A right-of-way has been secured from First West Street to the terminal site. It is planned to expend about \$250,000 for the erection of a station and other improvements on the new site.

Manufactures and Supplies

ROLLING STOCK

Lehigh Valley Transit Company, Allentown, Pa., expects to purchase additional cars.

Port Arthur (Ont.) Civic Railway has just constructed a new air-equipped snow plow in its own shops.

Sapulpa & Oil Field Railway, Tulsa, Okla., a new line, has ordered one Westinghouse electric freight locomotive and two electric cars with a capacity of forty-four persons.

Hawkinsville & Florida Southern Railroad, Macon, Ga., has ordered one gas-electric car which it expects to place in service in about a month. A second car will be acquired at a later date.

TRADE NOTES

Automatic Ventilator Company, New York, N. Y., has received orders for its ventilators from the Buffalo & Lake Erie Traction Company and the Davenport & Muscatine Railway.

Frank Ridlon Company, Boston, Mass., has been appointed New England representative of the Van Dorn & Dutton Company, Cleveland, Ohio, for its electric railway motor gears and pinions.

Van Dorn & Dutton Company, Cleveland, Ohio, has moved its New York office from 50 Church Street to 556 West Thirty-fourth Street. Frank Van Anden has been appointed as district sales manager in charge of the New York office.

E. B. Van Patten has been appointed sales representative for the Acme Supply Company, Chicago, Ill. Mr. Van Patten's territory will include the Southwestern States, where he is well acquainted, having represented other railway supply concerns in that district for the past eight years.

National Tube Company, Pittsburgh, Pa., on Nov. 18 will show a series of three industrial motion picture films before the Central Electric Railway Association in the Assembly Room of the Claypool Hotel, Indianapolis, Ind., illustrating the manufacture of "National" pipe from ore to finished product.

Perfection Springs Company, Cleveland, Ohio, has increased its capital stock from \$1,500,000 to \$2,500,000 and F. F. Prentiss, C. C. Bolton and T. E. Borton have been added to the board of directors. The increase in the capital stock was needed because of the heavy increase in business and the construction of large factory additions.

John A. Roebling's Sons Company, Trenton, N. J., on Nov. 11 lost by fire its factory building for the manufacture of small wire rope. The loss is estimated at \$1,000,000. The factory for heavy rope was not affected. The company will use new buildings, about completed, for the manufacture of small rope, and expects to be in operation in about two months.

Shaw Insulator Company, Newark, N. J., has completed a plant for the molding of composition into insulating parts for all electrical purposes such as generators, motors, starters, magnetos and special requirements. This insulation is manufactured from non-conducting materials carefully selected and tested in laboratory in actual service and is said to be free from excessive contraction and expansion, moisture absorption, varied dielectric strength, carbonization, mechanical imperfection and surface leakage. The material is impervious to acids and will exceed standard requirements for heat.

Paul M. Lincoln, whose term as president of the American Institute of Electrical Engineers expired on July 1 and who has for a number of years been prominently identified with the engineering department of the Westinghouse Electric & Manufacturing Company, has resigned his position with this company in order to be able to devote his time to the manufacture of a meter which he has recently invented. Mr. Lincoln was first connected with the Short Electric Company in Cleveland and then joined the Westinghouse Electric & Manufacturing Company. At the opening of the Niagara Falls Power Company's plant he became its electrical superintendent, but returned to the Westinghouse Company in 1902 and has been connected with it ever since.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces a number of changes in the supply department, which have recently been put into effect. S. A. Chase, formerly special representative; T. J. Pace, formerly in charge of illuminating and rectifier divisions, and Carl G. Schluederberg, formerly head of switchboard sales, have been appointed assistants to Manager J. J. Gibson. C. E. Stephens, engineer of lighting, has been appointed manager of the illuminating section to succeed Mr. Pace. C. Streamer, formerly head of the order division, succeeds Mr. Schluederberg as manager of the switchboard section, and A. P. Joseph is appointed head of the order section to succeed Mr. Streamer. M. C. Morrow, formerly of the Philadelphia office, is appointed manager of the appliance section, which is a combination of the former heating, fan motor and ozonizer divisions of the supply department. M. C. Rypinski, formerly manager of the D. & S. division of the New York office, becomes manager of the meter section. The power department, E. H. Sniffen manager, also announces the following section managers: W. H. Garrett, contracts; J. G. Worker, stokers, and H. D. Storer, auxiliaries.

ADVERTISING LITERATURE

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has issued a bulletin describing and illustrating its various types of telephone equipment. This company has also issued new price lists of its telephone construction material and supplies.

Lakewood Engineering Company, Cleveland, Ohio, has issued book No. 16 describing and illustrating its various type of industrial cars. These cars include side dump, bottom dump, end dump, all around dump, rack cars, removable sides, gate dump, scale cars, incline cars and platform cars. Many of the types of cars and trucks shown in the catalog can be furnished electrically equipped, either for overhead or underground trolley, third-rail or storage-battery operation, and with either flanged or flat tread wheels.

Calebaugh Self-Lubricating Carbon Company, Inc., Philadelphia, Pa., has issued a catalog describing completely its large number of types of "No-Spark" carbon brushes. A comprehensive price list of brushes adapted for a wide field of electrical machine design is included. The brushes have a complete range of varying resistances, from low to high conductivity, and embrace a wide scope of hardness, specific gravity and other properties necessary to successful operation. The catalog points out the types of brushes particularly adapted for street and interurban railway motors.

Spray Engineering Company, Boston, Mass., has issued a reprint of a paper read by Lee H. Parker, president of this company, before the convention of the National Association of Cotton Manufacturers at New London, Conn. The reprint traces the development of spray cooling of condensing water and contains illustrated descriptions of a number of typical installations. It also shows the advantages in general of a spray system over a cooling tower as regards the following points: saving in power required for operation, flexibility, less make-up water required, usability of spray cooling ponds as a source of supply for fire pumps, longer life and lower first cost.

Carnegie Steel Company, Pittsburgh, Pa., has issued a publication entitled "Steel Sheet Piling," tenth edition, which supersedes a similar pamphlet, ninth edition, issued in 1912 and which covers steel sheet piling for use in cofferdam construction, retaining walls, mine shafts, sewer trenches and other construction where wooden sheet piling is in service. The pamphlet contains tables and data not only on the sections manufactured by this company but on the uses of driving and pulling appliances together with a general discussion on earth and water pressures and the computation of bracing systems for cofferdams, retaining walls, etc., and contains notes on concrete and safe bearing loads for piles. The book also includes information on the weights of materials, strength of hoisting ropes, lifting capacity of tackle, tables on metric conversion and other tables, and thus covers all the ordinary requirements in a handbook intended for foundation engineers and contractors. While intended for free distribution to engineers and contractors engaged in foundation work, copies are available for general sale at 50 cents each.