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The Orderly Arrangement of Portable Shop Equipment

Most railways recognize the wisdom of keeping such emergency equipments as fire pails, hose reels and extinguishers in assigned places by using colored lamps, by painting red the adjacent building parts and by keeping the vicinity clear of obstructions. This commendable practice could well be extended to other items which are required either for emergencies or in the course of regular work. There is no valid reason why jacks and pinch bars, for instance, should not have their proper storage area indicated by a painted wall order reading "Keep Jacks and Pinch Bars Here." In like manner cabinets could be placed on the walls for wrenches, files and other tools which are not given out to individuals by the storekeeper for a formal receipt. It will also be found desirable to have metal screen lockers for the temporary storage of newly finished parts in those shops where the clearance between the machine tools and the walls is great enough to permit their installation. It is obvious that the men will save a great deal of time and do their work more freely wherever the orderly arrangement of equipment prevails.

Publicity for a Michigan Company

The Michigan United Railways has set a commendable example of publicity in its pamphlet report for the fiscal year ended April 30, 1910. This company showed gross earnings and income for that year of \$1,248,889. It operates about 225 miles of track, part of which is new construction. The fourth annual report contains a general discussion in reference to the property and earnings and detailed classifications of the principal improvements made by the company during the year in the cities reached by the system and on the interurban lines. It also gives a number of tables of details that many companies fail to present. The classifications of revenues and expenses are those adopted by the American Electric Railway Accountants' Association and the Interstate Commerce Commission. Full details are given, not only for the general operating expense accounts, but also for the various primary accounts. A statement relating to the funded debt shows the amount of accrued interest for the year and the proportions charged to income and to construction accounts. There are also various statements showing the total revenues and expenses by divisions of the system and by months. Totals of car miles and car hours are set forth by divisions and the average unit earnings of the system as a whole are given. The total number of passengers carried is shown by divisions and divided into cash and ticket passengers and transfer and pass traffic. What has been done by this company can be done with equal facility and advantage by the large electric railways of the country which now withhold the details of the results of operations.

Discussion on Schedules in Rapid Transit Service

During the discussions now going on in New York about the several rapid transit propositions before the public it has been only natural perhaps that questions relating to transportation subjects should have been discussed in the daily newspapers. Thus the puzzled correspondent of one metropolitan daily asked recently why the surface lines in Manhattan should protest so strongly against a universal transfer system when both bidders for the new rapid transit line have agreed, if their propositions are accepted, to carry passengers from Brooklyn to the outer confines of Bronx Borough for 5 cents! A more intelligent discussion has arisen in another paper over the question whether the "carrying capacity" of the present subway would be increased by running the trains faster or slower. At first the correspondents jumped to the conclusion that the more rapidly the trains were run the larger the number of passengers which could be carried. But later the point was made clear that with the same time interval between the trains an equal number of cars would pass a given point in a given time, irrespective of the speed at which the trains were run.

The Relation of Braking Efficiency to Headway

This is practically as far as this discussion went, but a few additional comments may be pertinent. The express tracks of the subway are divided into a number of sections or blocks, and at the entrance to each are placed a block signal and an automatic stop device. These signals and stops are designed so that a train is always separated from a following train by at least one block. The lengths of these blocks are determined by the distances required to bring trains to a stop from the highest speed at which the trains are run, taking into consideration the effects of grades and curves, and allowing a reasonable factor of safety. Any increase in the maximum speed of the trains would require an increase in the distance allowed for stopping the trains from the higher speed and would involve a lengthening of the blocks and an entire rearrangement of the signal system. If braking efficiency was uniform at all speeds the safe braking distance in feet to be allowed for a train to come to a stop would bear a constant ratio to the maximum speed, in miles per hour, at the instant the brakes were applied. But braking is not so efficient at high speeds as at low speeds, so that the safe braking distance for the higher speed would be greater proportionately than the increase in speed. Hence it would be necessary to lengthen the blocks in greater proportion than the speed was increased, and the time in seconds required to run through a block at full speed would be longer for the high speed than for the low speed. The time required to run through a block at full speed is the measure of minimum headway of trains, and if this time is increased by lengthening the blocks in greater proportion the minimum interval between trains likewise must be increased, with the result that the "carrying capacity" of the line would be decreased. A higher maximum speed, of course, would reduce the running time between stations, but it would not increase the carrying capacity of the road. Where the stations are near together the length of the station stop becomes an important factor of the headway on which trains can be run. This is the case in the New York subway, where the time which a train has to spend in the stations to receive and discharge passengers becomes the controlling factor of the headway, particularly during the rush hours.

TRANSFORMER INSTALLATION

The increasing use of higher transmission voltages in general power distribution renders it important to install transformer equipment according to the best practice no less than to exercise greater care than before in the selection of such apparatus. Not a few operating companies fail to take full advantage of progress in transformer design and improved methods of manufacture by specifying exact duplicates of old apparatus rather than electrically equivalent units. There is a positive difference in mechanical details, proportions, strength and shape of materials used in old and new transformers, and usually some slight differences in electrical characteristics. The specifying of duplicates is usually on the ground of common repair parts, symmetry of appearance and interchangeability. Since repairs likely to be required on new transformer units of modern manufacture are so slight as to be almost negligible, the question of spare parts is of little importance, and if the installation is well designed the new equivalent unit is entirely interchangeable with the old. Selection on the basis of electrical equivalence enables the operating company to take full advantage of new manufacturing processes tending to reduce the cost of equipment and to enjoy improvements in design leading toward better regulation, more sustained high efficiency and superior cooling arrangements.

Improved methods of shipping transformers have largely done away with the necessity of drying out the windings at the place of installation. The increased amount of money tied up in larger transformer units, however, necessitates periodical inspection and testing of the oil to guard against the accumulation of water, with cleaning of windings, terminals, pressure blocks and outlet bushings. The cleaning of coils can usually be well carried out by the use of a forced stream of oil against the windings and through the ventilating ducts. Although the efficiency of large transformer units is remarkably near 100 per cent, the total volume of heat dissipated at full load requires the best conditions of ventilation in substations, and it is significant that both air-cooled and water-cooled transformers will almost always operate at heavier loads for the same temperature rise in the winter as compared with the summer. In transformer houses containing no revolving machinery there is often a tendency to erect too small a building and one without adequate provision for air circulation. The practice of drying out transformer oil by the insertion of resistance grids has frequently led to overheating when the installation was placed in regular service, usually through the damaging of the oil and formation of deposits. To dry the oil by passing it through broken, unslaked lime and cheesecloth gives better results in cases where the equipment cannot be shipped to the plant ready for operation.

Failure to test the polarity of transformers to be operated in parallel frequently leads to heavy overloading or a short circuit severe enough to damage the windings. The simplicity with which polarity and ratio tests can be made leaves no excuse for their omission. Usually the simple plan of connecting the primaries in series and short-circuiting the corresponding secondary coils while a current is passing through the former coils in series answers all purposes. With transformers of like ratios and capacity parallel operation will be satisfactory when the voltage drop across the individual units is the same, but if the capacity differs the voltage drop across the larger unit must be multiplied by the ratio of the larger to the

smaller unit before making the comparisons. When the primaries are connected in series and the secondaries also practically no current flows in the latter if the polarity is wrong. It is worth noting that under short-circuiting conditions a force of a few pounds repulsion between primary and secondary coils may rise to well over a ton and produce distortions of winding of a most serious character. Regular records of temperature, voltage variation, resistance and loads are well worth the trouble required to make them if they keep an expensive installation in good condition.

LIVENING UP THE RATE HEARINGS

The railway rate hearings before the Interstate Commerce Commission had become a little tedious and needed a touch of variety to liven up things a bit. It is tiresome to listen to reiteration of the cycle of increased wages and increased rates, when the tune of lower costs and lower rates would be more welcome to the ear.

When Mr. Brandeis stated that, by introducing methods of efficiency, he could save the railways \$365,000,000 a year he took the lawyer's privilege of painting his case in vivid hues. One wonders why he has so long buried this talent. We have been running amuck in this country on the subject of conservation of natural resources, and yet Mr. Brandeis gravely testifies that he can save a sum compared with which all other potential savings fade as the dew before the sun. The amount with which he toys so playfully is 5 per cent on \$7,300,000,000. It is one-third of the total compensation paid to the steam railway employees of the country for the year ended June 30, 1908. It is nearly one-sixth of the operating revenues and is over one-fifth of the operating expenses of the steam carriers for that year.

We are well aware that remarkable economies have been effected in manufacturing plants by the introduction of efficiency methods, but Mr. Brandeis loses sight of the differences between the manufacturing and the railway business. The shop of the railway to which the so-called efficiency methods are supposed by Mr. Brandeis to be applicable is only an insignificant part of the plant and business of a transportation company. The proportions which the number of employees, the capital invested and the value of work done in the shop bear to the total force, investment and revenue of the railway plant are slight.

The manufacturer produces commodities; the railway produces a service. The manufacturer restricts or increases his output with the demand; the railway must operate its trains on a schedule which does not permit much flexibility. A large manufacturer may take his orders and then manufacture his goods with his costs and profits computed pretty accurately in advance; the railway must plan its service pretty much on the possible maximum demand and if its cars have to be run empty it has no recourse. The manufacturer has another chance to market his unsold goods; the railway service, once rendered, is gone forever. The manufacturer has a compact plant, possibly located in one building; the railway plant is in isolated centers, scattered along hundreds or thousands of miles of track. The manufacturer has a highly developed organization that works at high pressure; the railway, providing a service instead of a commodity, must submit to a terrible loss in efficiency through the necessary waste of time of station employees and trainmen. Part of the time of

station agents between trains is wasted, and the trainmen, when not actually engaged in active duty while on a train, waste time. Their idleness may be compared with that of the police and firemen of a great city.

The pity of it is that light, fantastic touches of the kind afforded by the argument of Mr. Brandeis delay the proceedings and delay the relief needed by the railways. That may be the object of such grotesque representations.

THE DEVELOPMENT OF FARE BOXES

It is within the memory of men not yet old that the "bobtail" horse cars of many street railways were equipped with fare boxes and passengers paid promptly after they entered or else braved the suspicious backward glances of the driver on the front platform. The front doors were provided with a change-making slide, and in some of the most palatial cars an inclined slot along each side of the car permitted a passenger to deposit a nickel without pushing his way to the front of the car. The nickel would then roll slowly into the till at the front end. When the size of the cars and the number of passengers carried became so large that one man could no longer keep track of the fares from the front platform conductors were employed on the back platform and the fare boxes disappeared. With the introduction of the modern prepayment car the fare box was again revived. From a simple money till with glass sides for the inspection of coins as they dropped from shelf to shelf, the fare boxes of to-day have been developed into complex pieces of mechanism, some of them performing the functions of coin separation and counting, automatic registration and even change making.

The first fare boxes were an economical expedient designed to enable one man to operate a car and at the same time supervise the collection of fares. While some modern fare boxes relieve the conductor of practically all effort and responsibility in the latter duty, they do not and probably never will permit taking the second member of the car crew off the rear platform. The justification for their use is the decreased labor and liability of error in turning in and checking the receipts of each conductor. It is a matter of opinion whether some of the refinements which have been introduced by ambitious inventors are necessary or even desirable from the standpoint of the railway company or the traveling public. The more complicated such a device is the more likely it is to get out of order and the greater is the first cost and weight.

The diversity of types of fare boxes now in use is often the cause of confusion on the part of passengers and of consequent delays in boarding. In New York City three or four different patterns are being tried on different lines, and the passenger who does not happen to have a nickel in change has no means of knowing whether he should drop in a quarter and get his change from the box or ask the conductor for change and then drop in a nickel. Until a standard type of fare box comes into general use the operation of cars equipped with fare boxes would be greatly facilitated and many disputes over payment of fares would be avoided if large and easily read signs were placed on the platform telling just what to do in paying a fare. The public has become accustomed to the prepayment plan in all the cities where it has been introduced, but the fare box is an even more perplexing innovation and requires just as much or perhaps more explanatory publicity for its successful application.

AUTOMATIC BLOCK SIGNALS AND TRAIN STOPS ON SINGLE-TRACK INTERURBAN LINE OF THE WASHINGTON WATER POWER COMPANY

The Washington Water Power Company has recently completed the installation of automatic block signals and train stops protecting 20.9 miles of single-track interurban railway between Spokane, Medical Lake and Cheney, Wash. Before contracting for this installation of signals R. A. Willson, general superintendent of railways of the Washington Water Power Company, made a careful investigation of several signal systems in use on electric railways and personally inspected many

Cheney Junction and Spokane, a distance of 7 miles, the single-track is used by northbound and southbound cars of both the Medical Lake and Cheney divisions. The installation of signals includes 24 home signals and five distant signals, which are installed at curves and other places where the view of the home signals is obstructed. In the section between Spokane and Cheney Junction there are three intermediate sidings and the line is divided into six blocks controlled by 14 track sections. Between Cheney Junction and Medical Lake there are two intermediate sidings and three blocks controlled by five track sections. The three blocks between Cheney Junction and Cheney are controlled by four track sections. The tracks at Cheney Junction are not protected with interlocking switches

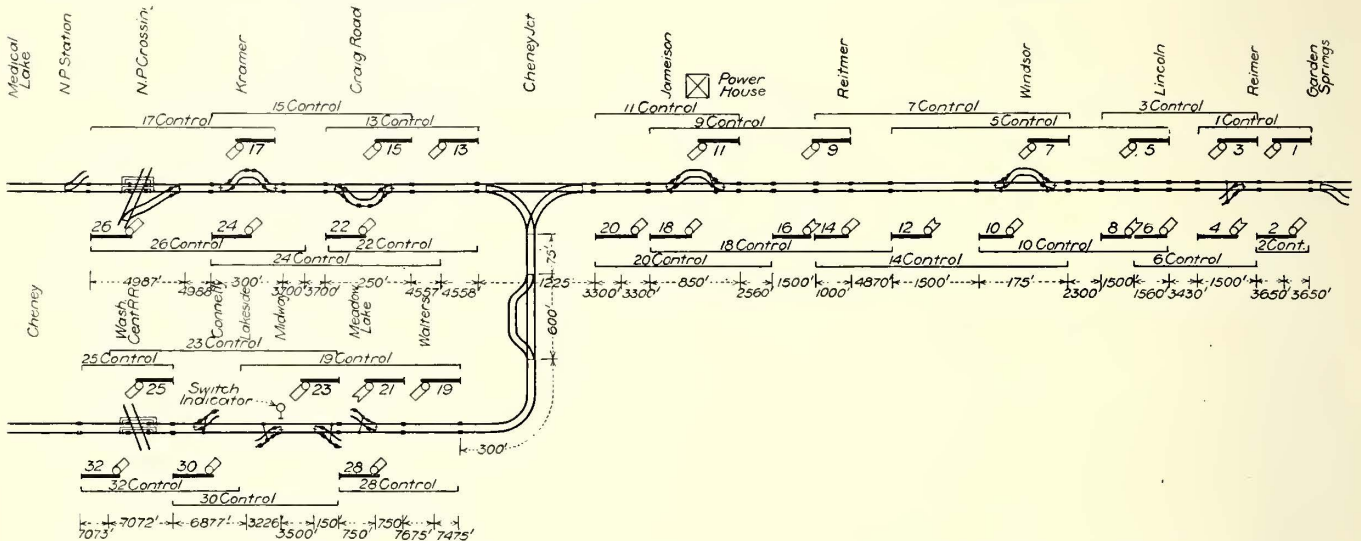


Fig. 1—Washington Water Power Company Signals—Location Plan of Signals and Sidings

installations in the Eastern States. As a result of this investigation a contract for a complete alternating-current signal system with continuous track-circuit control was awarded to the General Railway Signal Company, Rochester, N. Y., which designed the layout of the signals and furnished and installed all of the apparatus required. The signal mechanisms, relays, transformers and reactance bonds used are of the same general type as those furnished by the General Railway Signal Company for the signaling on the electric division of the New York Central

and signals and the automatic block signal protection is not carried through the junction.

SIGNAL CURRENT SUPPLY

A substation is located at Jameison, which is the approximate center of the line. Here 66,000-volt, three-phase, 60-cycle alternating current is taken from the transmission lines and converted by means of motor-generators to 600-volt direct current for the operation of the cars. Current for the operation of the signal system, including all track circuits, signal motors,

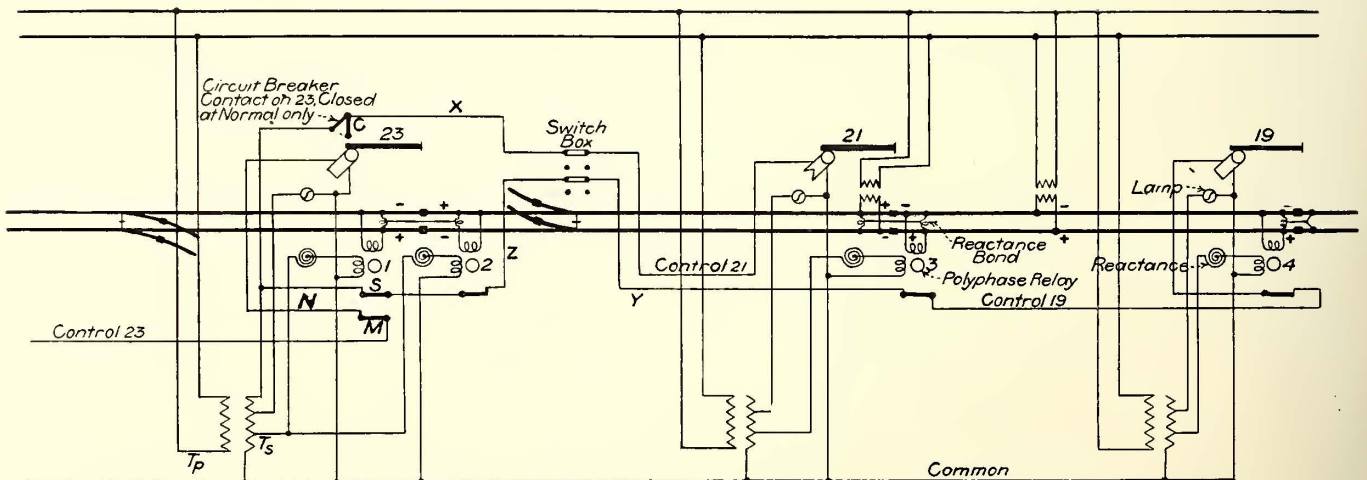


Fig. 2—Washington Water Power Company Signals—Typical Circuit Diagram

& Hudson River Railroad, the Long Island Railroad and the New York, New Haven & Hartford Railroad. In addition each home signal is fitted with an automatic stop-arm, which will be described later.

The location of the signals and sidings is shown in Fig. 1. Medical Lake is 12.3 miles southwest of Spokane, and a branch 8.6 miles long leaves the main line at Cheney Junction and extends to Cheney, which is south of Medical Lake. Between

signal lamps and relays, is obtained from one phase of the 66,000-volt transmission line by means of a step-down transformer which delivers single-phase current at 2200 volts and 60 cycles to the signal switchboard. Each signal transmission line is protected with automatic oil-insulated circuit-breakers equipped with I. T. E. time-limit relays and alarm bells. Measuring instruments for each line are mounted on the switchboard. From the substation, the signal transmission lines extend

toward Spokane and Medical Lake; the latter is tapped at Cheney Junction for the supply of the Cheney branch. These lines consist of two No. 10 hard-drawn copper weatherproof wires strung under the transmission lines on the same poles. The two No. 10 wires have sufficient capacity to carry the maximum load; that is, the simultaneous starting of all signal apparatus fed therefrom will produce a drop in voltage of less than 10 per cent at the end of the line. The signal transmission lines are protected against lightning by installing high-tension lightning arresters at intervals of about 1/2 mile. At each signal or track-feed location signal transformers are mounted on stub poles to step down the voltage as required.

TRACK CIRCUITS

A typical circuit for the control and operation of the signals for one block is shown at Fig. 2. At each signal location the track rails have insulated joints inserted in them to prevent the flow of the alternating current used for the track

each track section plus the 0.4 volt required for the operation of the track relays at the ends of each block. The two track rails are connected to one winding of a polyphase track relay, which will be described later, and current normally flows continuously through this relay unless the continuity of the track is broken or a car is in the block and a short-circuit is formed through the wheels and axles.

The reactance bonds which are installed at each cut section permit direct current to flow through them without appreciable loss, but effectively prevent the flow of alternating signal current. Each bond consists of an insulated copper conductor of large carrying capacity wound around an iron core and immersed in oil in an iron case which is set down in the ballast between the ties. The ends of the winding are connected to the two track rails on the same side of the insulated joints. A similar bond is inserted between the two rails of the adjoining section of track and the two bonds are then connected together

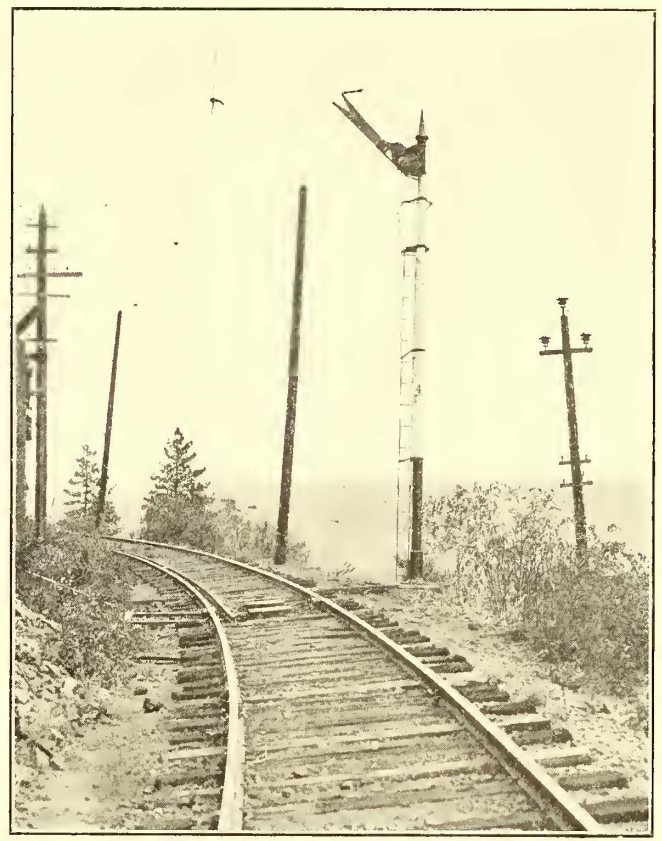
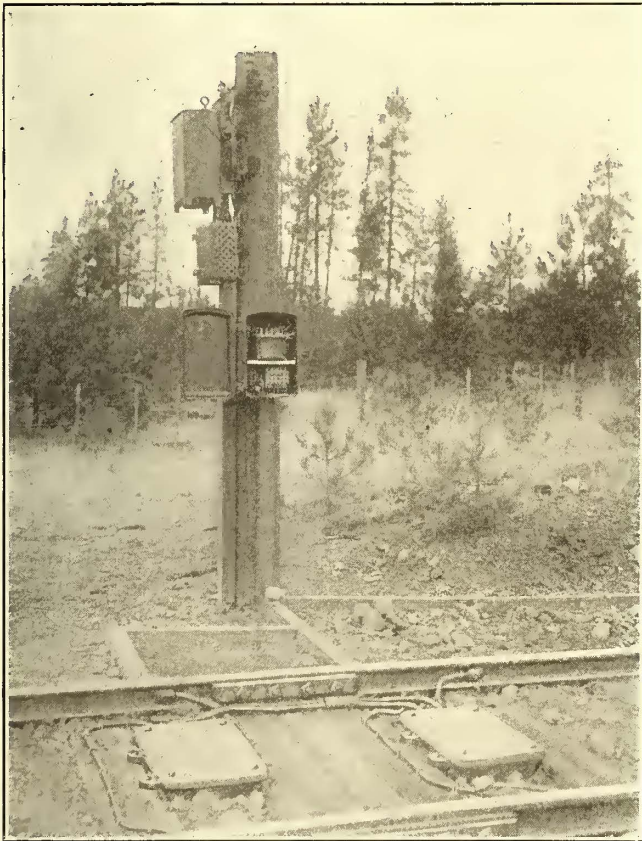


Fig. 3—Washington Water Power Company Signals—Transformer, Grid Resistance, Relay and Reactance Bonds

Fig. 4—Washington Water Power Company Signals—Distant Signal No. 4 on Sharp Curve West of Reinier

circuits beyond the limits of the block. A path for the flow of the return propulsion current is provided by reactance bonds installed at the cut sections. The method of supplying current to the track sections is dependent on the length of the section. Sections which are 4000 ft. or less in length are supplied from one end, while sections that are over 4000 ft. in length are supplied from the approximate center of their lengths. In order to provide protection against failures of the insulated rail joints what is known as "opposition of polarity" is provided in adjacent track sections; that is, a phase relation of 180 deg. is produced by alternate reversal of the connections of the transformer track secondaries to the rails. Grid resistances are connected in series with the transformer track secondaries and the track connections, so as to limit the flow of current when the track rails are short-circuited by a car in the block. Depending on the length and resistance of the track sections fed, current at 1 1/2 volts, 5 volts or 8 volts is taken from taps on the secondary windings of the transformers for feeding the track circuits. The voltage of the track-circuit current is adjusted in every case so as to provide an ample margin over the drop in

by a tap from the center of the winding of each. The coils, which are wound around iron cores, afford high reactance to interrupt the passage of alternating current, but have a low ohmic resistance and do not retard the flow of the return propulsion current. As a difference in the flow of return propulsion current through the two halves of a bond, due to a difference in the resistance of the track rails, would tend to magnetize the iron core and reduce the reactance, an adjustable air-gap is provided in the magnetic circuit of the bond by means of which any "unbalancing" may be corrected. The track circuits are carried around all intersecting tracks and at each siding they extend in on the switch rails beyond the fouling point, so that a car on a siding which is not completely clear of the main line would short-circuit the track relays as effectually as if the car stood on the main-line track. The track rails are 60-lb. A. S. C. E. section and the lengths of the blocks vary from 175 ft. to 15,150 ft.

TRANSFORMERS

The same type of transformer is used at track-feed locations and at signal locations. It is oil-cooled and has independent

secondary windings for the track circuit and the signal motor, signal lamp and relay circuit. The 2200-volt primary is protected with fuses inclosed in porcelain containers which are mounted on the back of the cross-arm supporting the transformer case on the stub pole. Each of the secondary windings is protected with a fuse and lightning arrester, which are mounted in the bottom of the relay box. The secondary for the track circuits is provided with three taps giving, respectively, 1½ volts, 5 volts and 8 volts, and the signal secondary has a 220-volt tap for the signal motor, a 55-volt tap for the signal lamps and a 28-volt tap for the relay local windings. All taps are connected to a terminal board for convenience in connecting to the exterior circuits. The transformer coils are impregnated with insulating compound by the vacuum process. A copper shield is inserted between the primary and secondary windings and is connected to ground through the transformer case so as to protect the windings in case of breakdown of the insulation due to lightning or other causes.

RELAYS

The relays used for controlling the operation of the signals are of so-called polyphase type. Motion is imparted to a horizontal swinging bar carrying the contacts by the revolution of the rotor of a small two-phase induction motor having two sets of stationary windings. One winding is in series across the track rails, and receives its energy through the track circuit which is fed from a transformer located at a distance. The other winding is supplied with current from the signal secondary of a local transformer with a sufficient reactance in-

count of the "opposition of polarity" connection previously mentioned. This would tend to cause the rotor to revolve in the opposite direction and would thereby prevent false operation of the relay. The standard relays are provided with four front and four back contacts, but only one or two of the front contacts on each relay are used for the simple signal circuits required for this installation. Friction of the moving parts is reduced to the minimum by the use of ball bearings throughout. The contacts rub through the last 1/16 in. of their travel, thereby insuring strong self-cleaning action on the surfaces.

SIGNALS

The signal mechanisms, which are the General Railway Signal Company's Model 2-A, are self-contained units inclosed in waterproof iron boxes which are clamped near the top of the tubular steel signal masts. They are designed to give indications in two positions in the upper left-hand quadrant. The arm of a home signal indicates "stop" when in the horizontal position and "proceed" when extended upward at an angle of 45 deg. from the horizontal. The upper left-hand quadrant was used instead of the upper right-hand quadrant in order to simplify the attachment of the automatic stop arms and to provide a better view of the signal arms, which would have been obstructed by the trolley span-wire poles if the right-hand quadrant had been employed. Standard three-light spectacle castings and semaphore blades are used. The home signal blades have square ends and the distant signal blades have notched ends.

The signal is operated by a small series-wound, commutating,

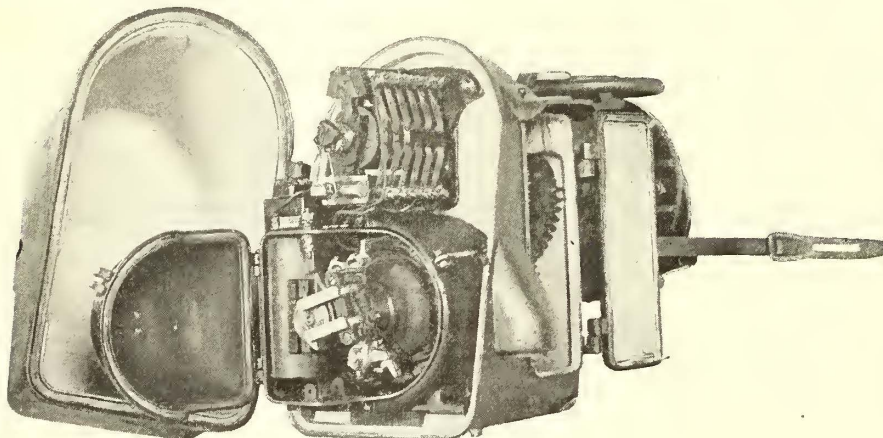


Fig. 5—Signal Mechanism, Case Open

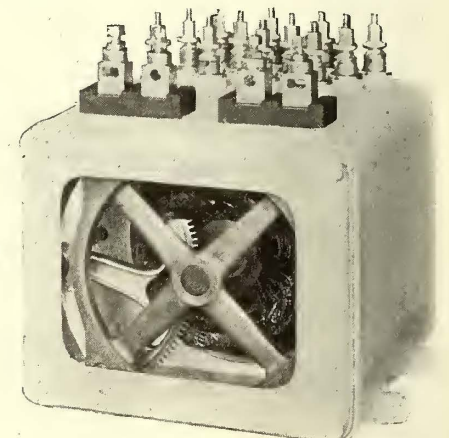


Fig. 6—Polyphase Relay

serted in series to produce a phase displacement of approximately 90 deg. By the use of two-phase relays with independent local and track-circuit windings economical operation of long track-circuit sections is secured. This arrangement provides for the supply of the major portion of the operating energy from a local source with low loss, and requires that only a small amount of the energy shall be supplied through the track circuit where the losses are high. The efficiency of this type of relay is shown by the fact that in this installation some relays are operating on continuous track sections more than 15,000 ft. long with only fair conditions of ballast and track leakage. This length of continuous track section has never before been equaled or even approached in signal work.

The shaft of the rotor carries on the rear end a small pinion which engages with a segmental gear mounted on a shaft extending through to the front of the relay, where it is connected by a crank to a horizontal swinging bar carrying the contacts. When both windings of the relay are energized by current of the proper phase relation, the rotor revolves and raises the segmental gear, thus closing the front contacts on the swinging bar. If either the track-circuit winding or the local transformer winding is short-circuited the motor loses its torque and the unbalanced weight of the segmental gear causes the relay to open by gravity. In case of broken insulation in a rail joint, current of opposite phase would be applied to the track winding of the relay of the adjoining track section on ac-

alternating-current 60-cycle, 220-volt motor designed to give sparkless commutation. This type of motor has high starting torque, high efficiency and requires only a small amount of current, both in starting and when running. The low current consumption is a valuable characteristic on account of the distance through which current is supplied from the transformer. It will be seen from Fig. 2 that each signal receives current from the transformer located at the next home signal in advance directly through the control wire without the use of an auxiliary relay. The length of these motor-operating circuits varies from 350 ft. to nearly 7 miles, and No. 10 copper is used both for the control and common wires. In the longest block the signal motor operates successfully with a circuit having a total line resistance of nearly 74 ohms.

The signal motor shaft is geared directly to the spectacle casting shaft. Mounted above the motor in the signal case is a rotating circuit-breaker which is geared to the spectacle casting shaft by segmental gears. It has 12 individually adjustable contacts for the control of as many separate circuits. On the end of the motor armature shaft is a small centrifugal governor which has contacts in series with the motor. At the beginning of the clearing movement these governor contacts are shunted by the circuit-breaker. Just before the signal arm reaches the proceed position the speed control becomes effective and prevents the motor from running too fast and carrying the signal arm past its proper position after the circuit-breaker opens. At

the end of the clearing movement the circuit-breaker cuts into the motor circuit sufficient reactance to prevent further movement of the arm, but enough voltage is retained in the motor circuit to hold the signal arm in its proper position. When the motor circuit is broken by the track relay or by failure of any of the line wires the signal arm returns to the horizontal or "stop" position by gravity.

The signal mechanism is simple in construction and fast and accurate in operation. The direct gearing of the motor to the semaphore operating shaft and the holding of the signal in the clear position by the motor render the use of a slot or dash-pot unnecessary.

LOCATION AND OPERATION OF SIGNALS

From an inspection of Fig. 1 it will be seen that at each through siding are placed two home signals controlling movements in opposite directions. In general, these signals are placed close to the entrance switches and not at exactly the same point on opposite sides of the track. Between sidings the home signals for opposite directions are not located at the same point in all cases, although at one or two locations, as for example, Nos. 2 and 3, and Nos. 23 and 28, the signals are placed opposite each other.

The signal circuits are arranged with overlap control so that when a car enters a block not only do the signal at the entrance and the signal controlling movements in the opposite direction at the exit end both assume the stop position, but the next home signal in the rear and any intermediate distant signals remain in the stop position until the car has passed out of

signals 25 and 32. The extent of the track circuit control for each signal is clearly indicated in Fig. 1, it being understood in studying this diagram that every signal assumes the stop position as soon as a car enters that portion of the track by which the signal is governed; that the signal remains in the stop position as long as the car is in that section of track; that it is immaterial as to which direction the car is moving when it enters the section of track by which the signal is governed, and that all op-



Fig. 7—Washington Water Power Company Signals—Home Signal and Automatic Stop Arm in Stop Position

the next block ahead of that which it is entering, or if the overlap control is less than a full block, that portion of the second block which is designed for the overlap control. Thus a car passing signal 23 and moving toward signal 25 sets signals 23 and 30 at stop and holds signals 21 and 19 in the rear at stop. Signal 19 does not clear until the car has passed the point of overlap control, which in this instance is the transformer located at the center of the track section between signals 23 and 30. Signals 23 and 21 will not clear until the car has passed the transformer at the center of the track circuit between sig-

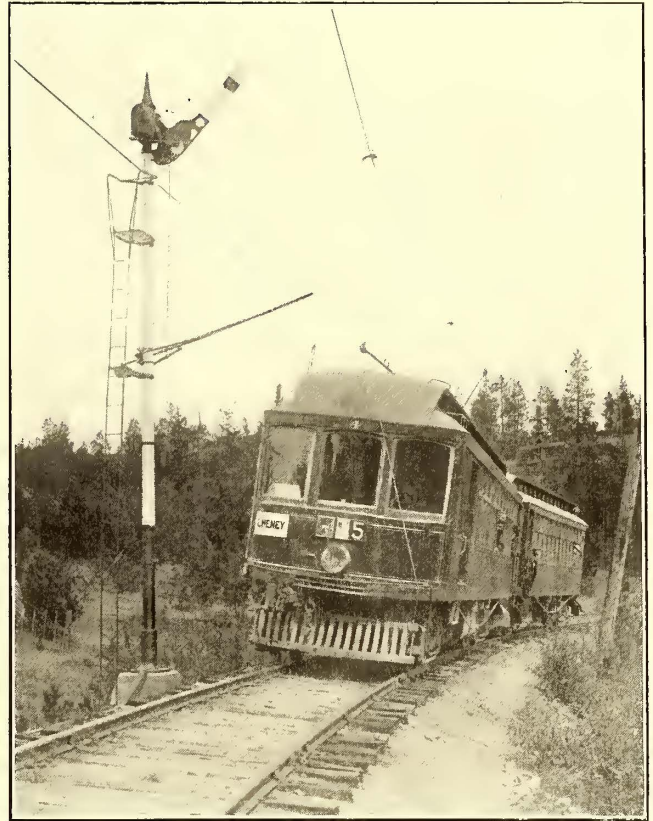


Fig. 8—Washington Water Power Company Signals—Home Signal and Automatic Stop Arm in Proceed Position

posing signals within the limits of control of a given signal are set or held at stop so long as the car is on that portion of the track which governs both the controlling signal and the opposing signal. It will be seen, therefore, that a car is always protected from following movements by at least two home signals in the rear and is likewise protected against opposing movements by at least one home signal in advance. A stop signal will always be set for one or the other of two approaching cars one block away from the more advanced of the two cars. The extension of the control for the signals governing the movements in one direction to a point beyond the location of the opposing signals eliminates any possibility of opposing cars both receiving stop signals due to their simultaneous entrance into their respective governing sections.

Referring to Fig. 2, if a car has just passed signal 23 it would short-circuit the track winding of relay 1, causing contacts *M* and *S* to open. Signal 23 is held at proceed by current flowing through control wire 23, contact *M*, wire *N*, signal motor to common wire. When contact *M* is opened this circuit is broken, and as the signal motor is no longer energized the semaphore arm falls to the stop position by gravity. The movement of the arm of home signal 23 opens a contact on the circuit-breaker *C*, which is geared to the arm. This opens the motor circuit of distant signal 21, which is from transformer *T*₈ through circuit-breaker *C*, wire *X*, switchbox, control 21, motor, to common wire. Distant signal 21 therefore remains in the caution position, while home signal 23 is at "stop." The opening of contact *S* on relay 1 breaks the motor circuit of signal 19, which is from transformer *T*₈ through contact *S* of relay 1, contact on relay 2, switchbox, wire *Y*, contact on relay 3,

control wire 19, contact on relay 4, signal motor to common wire.

Signal 19 would have been set at "stop" by the opening of the contact on relay 4 when the car passed signal 19, and it would have been held successively at stop by the opening of the contacts on relay 3 and relay 2 as the car had advanced to signal 23. The opening of a contact (not shown) on relay 2 when the car passed signal 21 would set signal 21 at "caution," and the opening of the circuit-breaker *C* on signal 23 would hold distant signal 21 in the caution position after the car had passed out of the track section by which signal 21 is directly governed and until the car had passed beyond the controlling point of signal 23.

As soon as the car passes out of the block, relay 1 picks up and closes contacts *S* and *M*. This restores the motor circuit of signal 19, causing the arm to move to "proceed," and as soon as home signal 23 closes contact *C* on the circuit-breaker distant signal 21 also clears. Signal 30, which is the opposing signal at the exit end of the block, is also controlled by a contact (not shown) on relay 1, and it is evident, therefore, that the entrance of the car into the block would also cause signal 30 to assume the stop position against opposing cars.

AUTOMATIC TRAIN STOP

The automatic train-stop device mentioned earlier is attached to each home signal mast. It consists of a pivoted metal arm projecting out over the track at such a height when in a horizontal position as just to clear the roofs of the cars. The stop arm is mechanically connected to and moves up and down in unison with the signal arm. Projecting above the roof of each motor car is a glass tube sealed at the top and connected to the train air-brake system by a pipe at the bottom. When the signal and automatic stop arm are in a horizontal position the glass tube on any car which passes the signal would be broken off and the air in the brake pipe would be released. This would automatically set the brakes with semi-service application and they could not be released until a new tube was substituted. In the event of failure of the signal and stop arm to clear, due to disarrangement of apparatus or circuits, means are provided for raising the stop arm by hand so as to permit a car to pass. It is only necessary to insert a key in an emergency release lock near the base of the pole, by means of which the stop arm may be raised by hand. The key cannot be removed until the emergency release is restored and again locked in its normal position. Each motor car is supplied with two extra glass tubes and the train crews are held strictly accountable for all breakages. This forms a most efficient check against careless or intentional over-running of signals.

The signals have been in operation only a short time, but they have proved very satisfactory. R. A. Willson, general superintendent of railways, states that it has not been found that the trainmen are any less careful in obeying the written orders of the train dispatchers since the block signals were put in use. If anything, the men are more careful, for the rules require that if a train crew find a signal set against them they must report immediately to the train dispatcher and receive an order before they are allowed to pass the signal. All train dispatching on the interurban lines of the Washington Water Power Company is done by telephone. During the first week in December considerable trouble was experienced with the telephone line, but the train crews were able to maintain schedules and operate with perfect safety, using the block signals as their only guide. All interurban trainmen are picked from among



Fig. 9—Automatic Stop Tube

the oldest in the employ of the company. None of the men on this division were familiar with block signaling and considerable time and effort was spent in instructing them in the operation of trains with signal protection. They have all been thoroughly examined on the rules relating to the signals.

The Cheney-Medical Lake line is now being operated on a winter schedule, but it has not been found necessary to change the time card which was in effect last winter before the signals were installed. During the winter months it is seldom necessary to operate trains in more than one section, but when extra trains have been put out on the line no difficulty has been experienced in handling them. The lengths of the blocks at the ends of the line are such that it requires about five minutes for a car to run through them, and this makes it necessary for a second section always to run from five to six minutes behind the first section. The first section thereafter does not delay or interfere with the second section following.

The regular meeting points are at Windsor siding, Jameison siding and Cheney Junction. The home signals at these points are overlapped on one end for a distance varying between 750 ft. and 3000 ft. At the meeting point at Windsor a westbound train in passing signal 5 at Lincoln would set at "stop" home signal 10 at the west end of Windsor siding and would also set at "caution" distant signal 12, which is 1710 ft. west of Windsor siding. If the motorman of an eastbound train found distant signal 12 at "caution" he would know that the westbound train which he was to meet had passed signal 5 at Lincoln. He would then proceed to home signal 10, prepared to stop and if he reached the siding ahead of the westbound train he would lock through the home signal, run in on the siding and clear up signal 7, which had been set from the block in the rear of Windsor. This would permit the westbound train to proceed through on the main line. The meeting points are arranged so that the first train to arrive takes the siding. This arrangement has proved very satisfactory. The train crews which have these regular meets help one another in getting through and practically no time is lost. Up to the present time the train dispatchers have had no trouble in handling trains and they have not had to change any of the regular meeting places.

Telephone jack boxes are located at each home signal so that the train crews can get into communication with the dispatcher immediately on arriving at a signal which is set against them and obtain orders to proceed or wait, as may be necessary. The company feels that the system which has been installed provides every possible protection against collisions, and it does not anticipate any trouble in the operation of trains during the busy season in the summer.

For the information from which the above description was prepared this paper is indebted in a large part to R. A. Willson, general superintendent of railways, Washington Water Power Company.

JOINT MEETING IN NEW YORK ON OVERHEAD CONSTRUCTION

The subject of standard specifications for overhead crossings of steam railroads with power, telephone and telegraph wires was discussed at a joint committee meeting which was held on Wednesday, Dec. 14, in the offices of the National Electric Light Association in New York. The meeting was the second within three weeks, and it is planned to have a third at an early date before a report is made to the National Electric Light Association. The committee is composed of Farley Osgood, of the Public Service Corporation of New Jersey, chairman and member of the Lighting Association; Robert Coombs, of the Pennsylvania Railroad, acting for the Maintenance of Way Association; Prof. A. S. Richey, of Worcester Polytechnic Institute, acting for the American Electric Railway Engineering Association, and Fred Rhodes, of the American Telephone & Telegraph Company, acting for the National Electric Light Association.

PRESIDENT HOUSE, OF BALTIMORE, DETAILS REASONS AGAINST ENTERING CARS BY THE FRONT DOOR

Last October the City Council of Baltimore passed an ordinance requiring cars to stop on the near side of all streets for the purpose of taking on and letting off passengers. This ordinance became effective on Nov. 25. Prior to this change it had been the practice of the United Railways & Electric Company of Baltimore to stop on the far side of all streets other than rapid transit intersections, where the near-side stop was made. This practice resulted in some confusion, so that the uniform near-side stop ordinance was framed with a view to simplifying matters. Recently, however, the press has been clamoring for the front-door entrance, to which the company is opposed. Passengers are permitted to alight from the front platform, but they are obliged to board from the rear.

In order to make clear to its patrons the just reasons for this rule, William A. House, president of the company, gave out the following interview, which was published in the Dec. 9 issue of the *Baltimore Evening Sun*:

"The practical operation of a street railway system is one that involves many problems which are naturally not appreciated by the public. How to handle large crowds in the rush hours in the congested districts of large cities is one of the problems that are giving street railway operators much concern. Experts are practically unanimous in agreeing that entrance and exit by both doors is not satisfactory. If this company felt that it could improve its service to the public in any way by permitting this it would not hesitate voluntarily to do so. It must be obvious to anyone that the prosperity of the company depends upon the celerity, safety and comfort with which it handles its patrons.

"If, therefore, as practical operators, we felt that these ends could be accomplished by permitting front-door entrance we should not hesitate to adopt it; but if such a regulation should be put in force we have no hesitancy in saying, and now place ourselves on record as predicting, that it would be bound to result in a largely increased number of injuries and fatal accidents and would not add as much to the comfort of the traveling public as many people seem to think.

"One thing that is not appreciated is that the rapid transit system of Baltimore materially differs from that of other cities, each city having problems peculiar to itself, and what may be feasible upon one system is not feasible upon another.

"Briefly summarized, this company does not deem it safe or expedient to permit the boarding of cars at the front platform for the following reasons, among others:

"1. The liability of serious or fatal accidents to passengers falling when boarding the front platform of a moving car is greatly increased. This is admitted even by the operators of roads upon which this practice prevails; and especially is there liability to accidents at curves, such as Baltimore and Calvert Streets and hundreds of other points upon the system where cars are not only moving forward, but have a radial motion as well.

"2. The boarding and alighting of passengers at the front platform would create confusion and congestion at a point where the conductor would have little control, resulting in delay. In order to overcome this very condition that formerly existed when all passengers left the car by the rear platform, the company inaugurated a rule providing for exit by the front. This congestion would be greatly increased by reason of the fact that there would be four distinct movements of passengers; that is, in and out at the front platform and in and out at the rear. The discomfort of those occupying the car would also be greatly added to, because the door would be open to allow passengers to leave by the front platform and would have to remain open for those persons boarding the car at this point, whereas, under the present rule, the motorman can close the door as soon as passengers have alighted. This would mean that the door would necessarily be kept open probably twice as long as under the present regulation.

"3. It is a recognized fact that the trend of movement in all public conveyances is to enter at one place and leave at another.

This practice is strictly followed by steam railroads in their stations in all large cities, and on elevated railways and ferries throughout the country in the handling of large numbers of people. It is also reflected in the traffic law recently adopted in this and other cities, which regulates the movement of vehicular traffic in fixed directions so as to prevent congestion and accident. It is equally true and applicable in the handling of street car traffic, which has been demonstrated since the rule permitting passengers to leave by the front platform was made effective; that is, the loading and unloading of street car traffic is made easier and quicker by this regulation.

"While the company is always ready to adopt the views of its patrons when practicable and it can be done with safety, it should be borne in mind that *safety* is the first consideration of railroading. The company should be permitted to surround the operation of its system with such safeguards as will, in its judgment, insure the greatest protection to its patrons.

"4. Stopping cars on the near side of streets is now required by city ordinance. To permit passengers to board by the front platform would mean that the rear platform would seldom be used, with the result that the loading and discharging of passengers would take place at the front end, beyond the control of the conductor.

"5. One of the main features of the pay-as-you-enter car, which is now being generally adopted throughout the country, is that it permits entrance by the rear only. The Pennsylvania Avenue line was equipped with this type of car in January last, and the company has recently placed an order for additional equipment of this type, which it proposes to place in service on another line. To permit ingress on some cars by the front door and prohibit it on others would at once result in endless confusion to patrons, as well as friction with motormen, due to the absence of uniformity in operation, when attempts were made to board pay-as-you-enter cars at the front end.

"For the reasons above stated, it is felt that the inauguration of such a departure from present methods would result in many serious and fatal accidents, which otherwise would not occur, as well as serious discomfort and delay to patrons.

"No doubt it will be claimed by some that the company's chief reason for opposing the plan proposed is the loss of fares that would result. It is frankly admitted that loss in this respect would ensue, but the governing reason for protesting against any departure from present methods is the humanitarian one; that is, it is better that there should be occasional inconvenience than the danger of accident.

"On a large system in a nearby city where entrance by the front door is permitted, much against the judgment of the company's officials, it is stated that 50 per cent of the accidents which result in loss of limb are caused by people attempting to board cars at the front platform. These accidents would not have occurred had the front doors been used for egress only.

"Since 1893 five ordinances have been passed affecting stops. An equal number of times have people been educated to the new change thus brought about and an equal number of times have they been required to unlearn and acquire a new habit. Any more changes cannot be helpful, but will prove demoralizing and dangerous. The step proposed is, in our judgment, a backward one and not in accordance with modern practice and safe and sane railroading."

OKLAHOMA PAY-AS-YOU-ENTER CARS

The *ELECTRIC RAILWAY JOURNAL* for Dec. 10, 1910, contained a detailed illustrated description of 10 center-vestibule steel cars built for the Oklahoma Railway Company. These prepayment cars are successfully operated under the pay-as-you-enter principle and have been licensed for this purpose by the Pay-as-You-Enter Car Corporation. The success of these cars is of special interest because this is another installation of the pay-as-you-enter methods for center-entrance and center-exit cars and shows the great flexibility of this design. The first installation was made at Montreal.

SYRACUSE INSTRUCTION BOOK

The Syracuse Rapid Transit Railway Company has recently prepared an instruction book which gives in convenient and simple form all the information which its motormen should have concerning the electrical equipment and air brakes used in Syracuse. The greater part of the booklet necessarily deals with a detailed reference to the general electrical equipment, such as the trolley, circuit-breaker and fuse, controller, resistance, car wiring, motors, lightning arresters and kicking coils. Most of these parts are illustrated. In addition, the portion on electrical equipment contains some important paragraphs on the steps which should be taken in case of troubles, such as repeated blowing of the circuit-breaker, dead cars, locked wheels, flooded rails, etc.

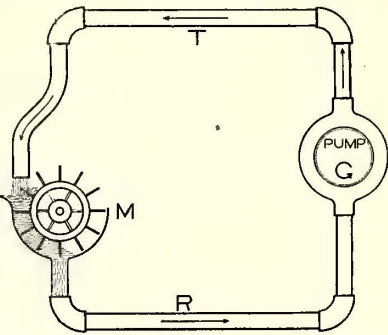


Fig. 1—Diagram of Water Power

Considerable attention is given also to the air-brake equipment. Definitions and illustrations are given of the principal parts, such as the air compressor, reservoir, motorman's brake valve, brake cylinder, governor, gage, switch and fuse. The difference between automatic and straight air brakes is also defined. The following information is included with reference to the use of the brakes:

"In the operation of air brakes of any type the main principle to be observed is that the greatest braking pressure should be exerted at the beginning of a stop and gradually decreased as the stop is approached, until only sufficient pressure remains when the stop is reached to hold the car. The brakes should never be applied gradually and the pressure increased as the stopping point is approached. The reason for exerting the highest pressure first is that a quicker stop can be made in this manner, and there is less danger of sliding wheels and wasting air. With the car wheels turning at a high rate of speed a very high brake pressure may be applied to them without skidding, whereas if they were turning slowly the same amount of pressure would stop them at once. Therefore, the brake pressure should be highest when the car speed is highest and should be decreased as the car speed decreases. To illustrate this point, if a grindstone be turned at a high speed and a man press a block of wood against the surface with all his strength he will not be able to stop the wheel at once, while if the wheel is turning slowly he can stop it immediately by using the same amount of force.

"When stopping on a slippery rail, apply the brakes more lightly than for an ordinary stop and allow a greater distance in which to bring the car to a standstill.

"If the wheels slide after the air is applied, release the brakes and allow the wheels to begin to turn, then apply the air again more lightly.

"Air should never be released and applied again except when wheels are sliding. Enough air should be taken at the first application to make the stop. If more air is needed go directly from lap position to service application position without releasing any of the air already in the cylinder. The shortest, quickest and easiest stop is obtained by taking all the air required on the first application."

The portion on air-brake instruction also contains an air-

brake leverage diagram and air piping scheme. This is followed by a series of instructions relating to miscellaneous matters, like fenders, heaters, sanding, etc. There are no cut-and-dried questions and answers so that the student will pay more attention to understanding the instructions than to memorizing them.

ILLUSTRATED HYDRAULIC ANALOGY TO EXPLAIN THE ELECTRICAL EQUIPMENT

The flow of water through pipes connected in series, parallel and series-parallel always offers an effective analogy to the action of an electric current flowing through like circuits. The Syracuse company has applied this comparison to good advantage, as will appear from the accompanying illustrations and text, which form a part of the general instructions on electrical equipment:

"To understand the principle of electric motors and their control we may compare electrical power to water power. In the imaginary case in the diagram, Fig. 1, *G* is a water pump, *M* is a water-wheel, *T* and *R* are delivery and return pipes.

"For the sake of comparison we will say that water is pumped by the pump *G* through pipe *T* to a distant point where it drives the water-wheel *M*. Discharging from this it returns to pipe *R* to the pump to be used over again. Of course, a system of this kind is not practicable, but it serves to illustrate the electric current used in electric car operation. In the case of the electric power the source of supply corresponding to the pump *G* is the generator at the power station. The pipe *T* is the trolley wire or third-rail, the water-wheel *M* is the motor on the car and the pipe *R* is the rail.

"A motor operates by magnetic force set up within it by current passing through its windings. The current in passing through the windings or through any electrical conductor will heat that conductor to a greater or less extent.

"If a water-wheel were standing still and the full volume of water was suddenly allowed to act upon it the effect would be

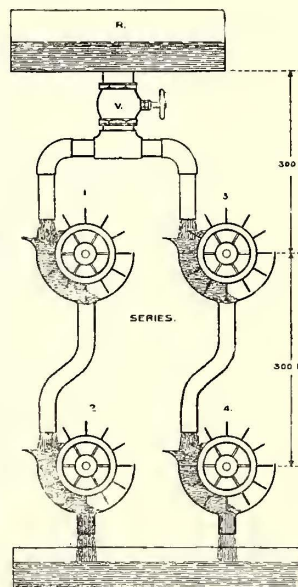


Fig. 2—Water-Wheels in Series-Parallel

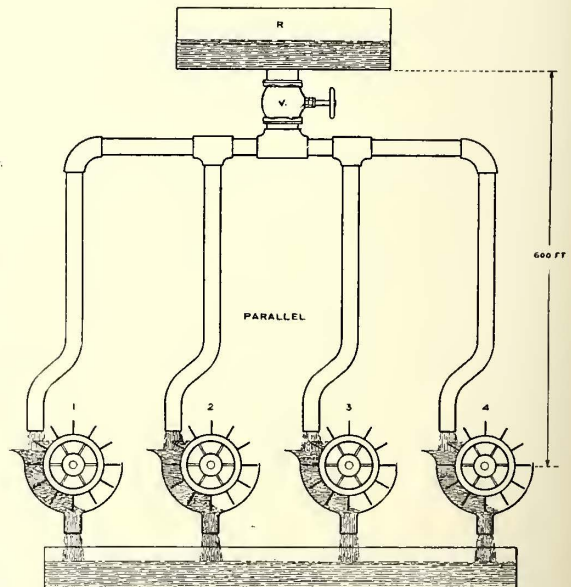


Fig. 3—Water-Wheels Grouped in Full Parallel

a violent strain upon its parts, probably resulting in breakage. This is the same effect which would be caused if the full force of the electric current was turned on a motor suddenly. It would cause a severe strain on the motor, resulting in great damage to it. For this reason it is necessary to use protective devices and controlling appliances consisting of circuit-breakers, fuses, controllers and resistance.

"The speed of a car is governed not only by the rheostat or resistance, but by the manner in which the motors are connected. The methods of connecting motors are commonly known as series and parallel. This can be best understood by comparing again with the water-wheel.

"In Fig. 2 R is a reservoir or supply of water which is connected by means of pipes to the water-wheels Nos. 1, 2, 3 and 4, as shown. With this combination the water after turning No. 1 wheel is collected and passes on, turning No. 2 wheel before it is discharged. When wheels are connected one after another in this manner they are said to be connected in series. Fig. 2 shows the manner in which four water-wheels may be connected, corresponding to the connections of a four-motor car when it is running in series-parallel. A two-motor car would be similar to the water-wheels if Nos. 3 and 4 wheels were taken away.

"If the four wheels are connected as shown in Fig. 3 they are connected in the same manner as the motors on a four-motor car when they are all in parallel. With a two-motor car the connection would be similar to the water-wheels if Nos. 3 and 4 wheels were taken away. To carry the comparison further: If the reservoir in Fig. 2 were 300 ft. above No. 1 wheel and the No. 1 wheel were 300 ft. above the No. 2 wheel, the No. 1 wheel would receive the pressure of a 300-ft. column of water and the No. 2 wheel would also receive the pressure of a 300-ft. column of water. Thus, as the reservoir is 600 ft. above No. 2 wheel, each wheel receives half of the total water pressure. In the same manner when two electric motors are running in series each receives half of the total pressure and if the trolley wire carries 600 volts each motor will receive 300 volts.

"The same line of reasoning holds good with the water-wheels connected as shown in Fig. 3, in which the reservoir is 600 ft. above the wheels; each wheel will receive the pressure of 600 ft. of water. Similarly if the motors on a car are connected in parallel and the pressure of the current in the trolley is 600 volts, each motor will receive the full pressure of 600 volts.

"If a by-pass pipe were arranged to carry the water past No. 1 and No. 3 wheels in Fig. 2, we should have wheels Nos. 2 and 4 working under full head of 600 ft. of water. This is exactly the condition we obtain when No. 1 and No. 3 motors are cut out on a car. No. 2 and No. 4 motors are then operated alone under full pressure, or 600 volts. In the same way if No. 2 and No. 4 motors were cut out No. 1 and No. 3 would be operating alone under full pressure, or 600 volts.

"If the pressure of 300 ft. or 600 ft. of water mentioned in the above paragraph were suddenly applied to the water-wheels they would be damaged, while if the pressure were applied slowly by gradually opening the valve, the wheels would start slowly and would not be injured. This is similar to the manner in which the controller governs the application of current to motors. The notching up of the controller slowly applies the power gradually and without injury to the motors, while feeding too rapidly applies the current strongly and injures the motors."

WHAT IS THE MATTER WITH BUSINESS?

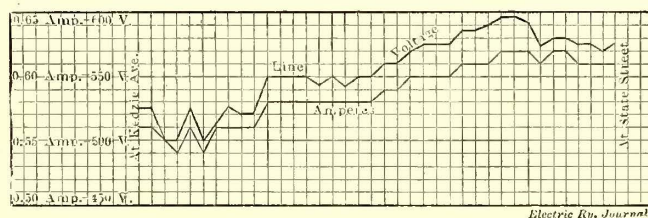
An article published in *American Industries* for December on the subject "What Is the Matter with Business?" written by Henry Harrison Lewis sums up as follows the hundreds of answers received from members of the National Association of Manufacturers giving their views on what is needed to help business:

- "Less legislative interference with business.
- "Less political activity.
- "A speedy and equitable settlement of the railway rate question.
- "More conservatism in business.
- "More national and individual confidence.
- "Take the tariff out of politics.
- "Give equal opportunities to all workmen by making the 'closed shop' illegal.
- "Reform of the currency and banking systems.
- "Prompt decisions in the important industrial questions now before the United States Supreme Court.
- "More attention to foreign trade and rehabilitation of the merchant marine."

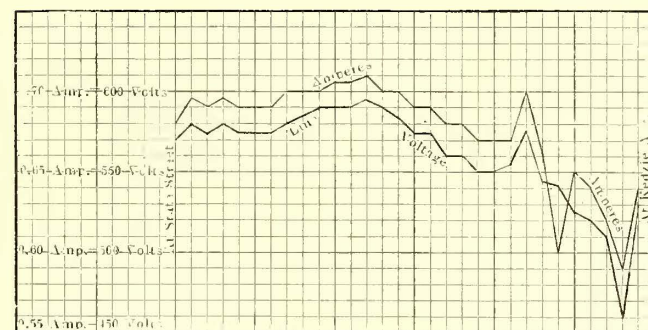
TANTALUM LAMPS ON CHICAGO RAILWAYS CARS

The Chicago Railways Company, after a series of comprehensive investigations, has installed tantalum lamps in nearly 1000 large pay-as-you-enter cars. The investigations have shown an average saving of not less than 5 cents per car day on the generous basis of 1800 hours of illumination per car year. This now means a saving of \$18,000 a year, and fully \$35,000 a year will be saved when tantalum lamps have been installed in the 2000 cars finally to be operated by the company. The higher cost of tantalum lamps over carbon lamps, including interest, is found to be balanced at the end of the first year by the longer life of the metal-filament lamps, and the saving is shown in reduced power consumption. This is a particularly important feature for a company which purchases power, as does the Chicago Railways Company, and pays a premium on peak loads, since in the winter months the lighting of the cars during the evening rush greatly increases the maximum current demand for the system.

The investigation of tantalum lamps was started in September, 1909, and in this work two men were engaged all the time



Electric Ry. Journal



Electric Ry. Journal

Tantalum Lamp Test—Typical Current and Voltage Records

and eight men part of the time; but even during the first few months of the test period the saving in energy was more than sufficient to pay for the cost of obtaining full records of lamp performance.

CONDITIONS OF TESTS

The objects of the test were to determine (1) renewals per car month, (2) energy economy, (3) correct voltage rating of lamp for the service and, in general, the adaptability of tantalum lamps to street-car service. The methods followed in obtaining the data and the detail results of some of the tests are of particular interest as indicating the thorough way in which the work was executed.

To obtain comparative data on various makes of lamps, from three to six cars on the Van Buren Street line were fitted with each kind of lamp to be tested. The length of the run of the Van Buren Street cars on which the lamps were tested is 4 miles and for the major part of this distance the track is in excellent condition. Some of the cars were equipped with Buckeye lamps, others with Colonial and still others with Bryan-Marsh lamps. Similar observations were made for all the lamps installed. The performance of each lamp was watched very closely over periods varying from two to six months, the entire testing work occupying a year.

Lamp tests were made in new and rebuilt double-truck pay-as-you-enter cars, each about 50 ft. long. These cars were in regular service. Each car uses 27 lamps, of which 7 are of 32 cp and 20 of 16 cp. The lamps are arranged as follows:

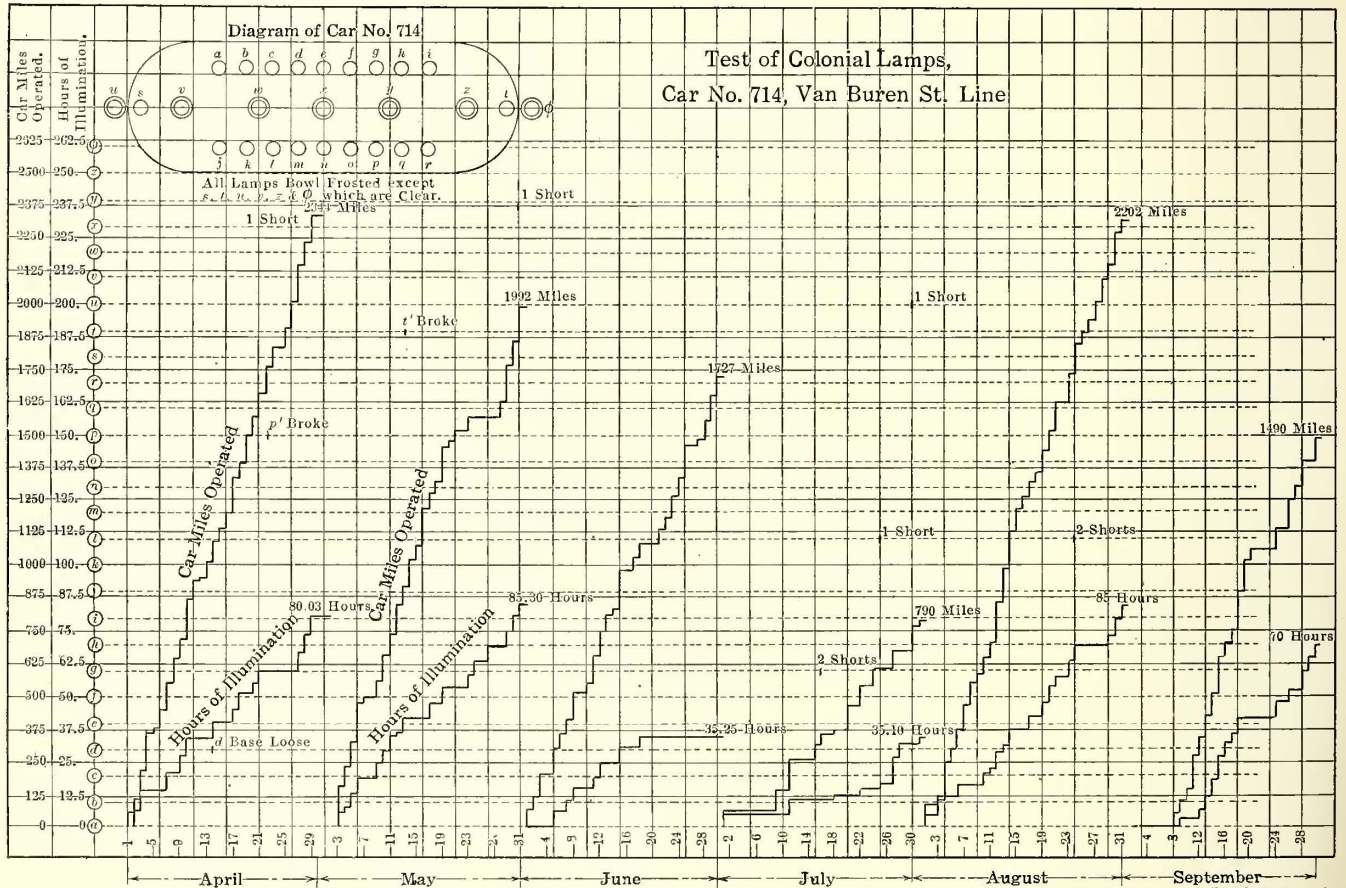
Nine sockets under each deck rail, three sockets spaced evenly along the center of the upper deck, one socket over the conductor's position on each end, one socket in the sign box at each end and one socket in each headlight. The 18 side lamps and the two sign lamps make four circuits of five lamps each across line voltage. The three lamps in the upper deck are connected in series with the forward headlight lamp and the conductor's lamp on the rear platform. When the direction of running is reversed the latter lamps are cut out and their duplicates on the opposite platform are lighted. Lamps of 16 cp are used for side and sign lights. The center, platform and headlight lamps are 32 cp.

HOW OBSERVATIONS WERE MADE

To determine the lamp renewals per month for lamps of each manufacture and for each car, a system of records was devised which showed each day the condition of every lamp under observation. Records also were made in graphical form. The lamp observers made records of the following data: Daily car

show the completeness of the data entered thereon. The horizontal scale indicates days of the month from April 1 to Sept. 30, inclusive. The record chart has two vertical scales; one scale shows the mileage of the car and a parallel scale shows the hours of illumination on the car. With these scales curves representing car mileage and hours of illumination for each day are plotted. To save space the curves are started at zero on the first of each month.

In addition to the curves just described 27 lines are drawn across each chart on which to record the renewal dates of the lamps. A key letter is given to each lamp position in a car, as indicated on the diagram, and the 27 lines are lettered similarly. Thus each one of the 27 horizontal lines extending across the chart represents one lamp position in the car. During the test period any change in the condition of any lamp was noted on the horizontal representing that lamp position and the note was made over the proper date, according to the horizontal scale of the chart.



Tantalum Lamp Test—Diagram Showing Method of Charting Car Miles, Illumination Hours and Lamp Failures

mileage, daily hours of illumination, date of each lamp renewal, position in car of each lamp renewed and the cause of failure, whether it might be from a short-circuit filament, loose bulb, broken bulb or missing lamp. At intervals of two months careful measurements of the voltage and the lamp load were made for each car. Good instruments were installed on the car and continuous readings were taken of pressure and current during a full round trip. These readings gave a record of the actual consumption of the lamps, from which the individual wattage of an average lamp could closely be determined.

GRAPHICAL RECORDS OF LAMP PERFORMANCE

One of the graphical record sheets, covering the performance of each lamp burned on one car during a test period of six months, is reproduced. Such record charts were made for each car carrying lamps under test. The original size of one of these charts is 21 in. x 14 in. The data as obtained were copied on tracing paper, so that blue prints could be taken for binding in loose-leaf form.

Reference to the graphical record of lamp performance will

With the data thus shown on the chart, it is easily possible to find the number of lamp renewals necessary at each socket during the test period, learn the date on which each new lamp was put in and ascertain by references to the mileage and illumination curves the number of miles that the car had traveled and the hours that the lamp had burned up to the time of renewal. These graphical records, one for each car on which tantalum lamps were installed for testing, have been bound in loose-leaf book form and so give a complete record of the original data obtained. The particular chart shown is that of car 714, which had few lamp failures. Hence few notes were required on the horizontal lamp lines.

The results from observations of each kind of lamp installed on several cars were assembled as shown in Table I. This is a summary of the first tests made on Buckeye lamps. There were 20 16-cp and 7 32-cp lamps, all with clear glass bulbs.

The columns of data entered in Table I are obtained as follows:

Column 1, car numbers.

Column 2, beginning and ending dates of the test period.
 Column 3, miles operated by a car during the test period.
 Column 4, total hours that lamps burned during test period.
 Column 5, number of 32-cp lamps of original installation which were still burning at the end of the test period.

although with the tantalum lamp this did not reduce the candle-power. No allowance was made for the two lamps of the seven in the 32-cp circuit which did not burn on account of the switchback arrangement for double-end operation. Because the tests recorded in Table I were the first made, because

TABLE I.—RECORD OF BUCKEYE TANTALUM LAMPS, CHICAGO RAILWAYS

Lamps installed per car: 18 16-cp sides, 2 16-cp sign, 3 32-cp centers, 2 32-cp clear bulb platform, 2 32-cp clear bulb headlights. Total, 20 16-cp lamps and 7 32-cp lamps.

Car No.	Dates	Miles Operated	Hours Illuminated	Renewals of 32-cp Lamps				Renewals of 16-cp Lamps			
				O. K.	During Test	Per Year	Per Cent	O. K.	During Test	Per Year	Per Cent
316	Sept. 20, 1909.....	9,524	814	0	28	62	886	6	27	60	300
	Dec. 20, 1909.....	.....	.....	..	..	..	..	..	..	..	..
316	Dec. 20, 1909.....	7,249	494	5	2	7	100	4	16	58	290
	Feb. 20, 1910.....	.....	.....	..	..	..	..	..	..	..	..
315	Dec. 1, 1909.....	9,046	640	1	9	25	357	9	18	50	250
	Feb. 28, 1910.....	.....	.....	..	..	..	..	..	..	..	..
353	Dec. 1, 1909.....	8,697	680	4	6	16	229	12	11	29	145
	Feb. 28, 1910.....	.....	.....	..	..	..	..	..	..	..	..
Totals and averages.....		{ 8,629 8,629	657 657	10 All sizes combined.	45	120	439	31 72 117	197 320	246 296	

NOTES.—Lamps renewed after one short-circuit. Renewals per car month, yearly average basis, $320 \div (4 \times 12) = 6.67$. Car 316—Night service; clear bulbs; 16 cp, 118 volts; 32 cp, 110 volts; replaced after one short-circuit. Car 316—Second period; clear bulbs; 16 cp, 118 volts; 32 cp, 120 volts; changed after two short-circuits. Car 315—Lamps, 120 volts, side and center, bowl frosted; side and sign, 12½ cp, changed after two short-circuits. Car 353—Lamps, 120 volts, side and center, bowl frosted; side and sign, 16 cp; changed after two short-circuits.

Column 6, number of 32-cp lamps which were needed for renewals during the test period.

Column 7, number of 32-cp lamps that would be needed for renewals if test period had been one year, assuming 1800 hours of burning during the year. Column 7 is found by multiplying Column 6 by 1800 and dividing the result by Column 4.

Column 8 is the percentage of renewals per year per socket

the voltage of the lamps was not exactly suited for the service, and because the lamps in Car 316 were replaced after one short-circuit, the results are not so good as were later found.

Attention is called to the footnotes showing the changes in the kinds of lamps during the course of this test. It was found that the 12½-cp lamps did not give sufficient illumination. It is interesting to note that during the tests shown in Table I

TABLE II.—ENERGY CONSUMPTION OF BUCKEYE TANTALUM LAMPS, CHICAGO RAILWAYS, TESTS MADE AT END OF PERIODS AS NOTED BELOW.

Car No.	Period	Energy consumption at the car	Readings taken over the entire route.																																								
316	First Period: Dec. 24, 1909.	<table border="1"> <tr> <th colspan="3">5 32-cp Circuit</th> <th colspan="3">10 16-cp Circuit</th> </tr> <tr> <th>Volts.</th> <th>Amps.</th> <th>Kw.</th> <th>Volts.</th> <th>Amps.</th> <th>Kw.</th> </tr> <tr> <td>Maximum</td> <td>506</td> <td>.620</td> <td>595</td> <td>.710</td> <td>.422</td> </tr> <tr> <td>Minimum</td> <td>500</td> <td>.540</td> <td>460</td> <td>.590</td> <td>.271</td> </tr> <tr> <td>Average</td> <td>555</td> <td>.586</td> <td>502</td> <td>.677</td> <td>.380</td> </tr> </table>	5 32-cp Circuit			10 16-cp Circuit			Volts.	Amps.	Kw.	Volts.	Amps.	Kw.	Maximum	506	.620	595	.710	.422	Minimum	500	.540	460	.590	.271	Average	555	.586	502	.677	.380	<table border="1"> <tr> <th>Total kw per Car.</th> <th>Remarks.</th> </tr> <tr> <td>Lamp Circuits.</td> <td>All lamps clear bulbs.</td> </tr> <tr> <td>1.214</td> <td>16 cp — 118 volts.</td> </tr> <tr> <td>.812</td> <td>32 cp — 120 volts.</td> </tr> <tr> <td>1.085</td> <td></td> </tr> </table>	Total kw per Car.	Remarks.	Lamp Circuits.	All lamps clear bulbs.	1.214	16 cp — 118 volts.	.812	32 cp — 120 volts.	1.085	
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in the 32-cp lamp series. It is found by dividing Column 7 by seven, there being seven lamps in the 32-cp series.

Column 9 shows the number of 16-cp lights out of the 20 on the car that came through the test period without renewal.

Column 10 shows the number of 16-cp lights used for renewal purposes.

two 16-cp lamps burned a total of 1308 hours each. One of these lamps had one short-circuit and the other a loose bulb at the end of the test period.

It is stated that the 1800 hours allowed as the illumination required during the year is a generous figure, according to the records kept during the year of testing. It will also be noted

TABLE III.—SIX MONTHS' TEST, APRIL 1 TO SEPT. 30, 1910, OF 115-VOLT "COLONIAL" LAMPS

Lamps installed per car: 18 16-cp sides, 2 16-cp sign, 3 32-cp center, 2 32-cp platform, 2 32-cp headlight.

Car No.	Miles Operated	Hours Illuminated	O. K.	Renewals of 32-cp Lamps			Renewals of 16-cp Lamps			Remarks	
				During Test	Per Year	Per Cent	O. K.	During Test	Per Year		Per Cent
705	8,941	377	3	11	53	757	17	4	19	95	All lamps Ct. Bt.
711	11,366	435	2	6	25	357	18	2	8	40	All lamps Ct. Bt.
704	9,429	382	3	7	33	472	16	6	28	140	S. & C. lamps Bt. Fr.
714	10,545	391	7	0	..	..	18	2	9	15	S. & C. lamps Bt. Fr.
716	11,125	454	7	0	..	..	16	4	16	80	S. & C. lamps Bt. Fr.
731	10,253	417	4	4	17	243	..	..	13	65	S. & C. lacquered
All	110,276	4409	..	b28	b123	a293	..	b21	b92	a77	
All	110,276	4409	..	Both kinds of lamps			..	b10	b216	x133	

NOTES.—a = average; b = total; x = obtained by dividing 216 by (6 x 27). Lamps renewed after three short-circuits. Renewals per car month, yearly average basis, $216 \div (6 \times 12) = 3.00$. Of above renewals, two 30-cp and five 16-cp were stolen from cars. Same lamps used for centers and headlights, being pear-shaped 32-cp.

Column 11 shows the number of 16-cp lights that would be needed for renewals in the car on a yearly basis.

Column 12 shows the number of renewals per year for 16-cp lamps.

In this test it is important to note that the lamps in Car 316 were renewed as soon as the filament had one short-circuit,

in analyzing the data given in this and the following tables that wherever any adjustment in calculation has been made the life of the lamps has been favored. The renewals per car month, which is the desired figure, on a yearly average basis for the test periods indicated in Table I were 6.67 lamps.

Voltage and mileage curves taken over the routes in both

directions were made. Two curves are shown on page 1190; one indicates the volt-amperes on the 32-cp, 5-lamp circuit, and the other is for a 10-lamp 16-cp sidelight circuit. Table II shows the energy consumption of the Buckeye tantalum lamps at the car, as measured at the end of each two-month test period. These readings are the average of a considerable number of instantaneous readings.

Table III shows the results of a six months' test with "Colonial" 115-volt lamps installed on six different cars. The renewals per month as determined from the data of this table were only three, in comparison with 6.67 for the tests shown in Table I. The principal reasons for this considerable reduction in the number of renewals per month were the use of a lamp with more suitable voltage rating and the renewing of lamps only after the filaments had short-circuited three times, rather than renewing them after one and two short-circuits, as was done in the tests covered by Table I.

STANDARD LAMP

After extensive testing of the lamps noted in the accompanying table and several other makes, a standard 115-volt lamp rated at 35 watts for 16 cp and 70 watts for 32 cp was installed on nearly 1000 of the large new cars of the Chicago Railways. These lamps were manufactured by the Bryan-Marsh Lamp Company, and since their installation they have had special attention so that the engineering department might learn more regarding the comparative performance of carbon and tantalum lamps when installed on a large number of cars. Stock ledgers containing accounts with each car house are used to record the disposition of each lamp purchased by the company.

The renewals per month required by the burned-out, broken or stolen lamps and covering a large number of cars equipped with Bryan-Marsh lamps of 16 cp and 32 cp are given as follows:

Period	Renewals per car per month	Car months
May 23 to Aug. 1, inclusive.....	2.18	558
Aug. 1 to Aug. 31, inclusive.....	1.72	644
Sept. 1 to Sept. 30, inclusive.....	1.91	644
Oct. 1 to Oct. 31, inclusive.....	2.59	689

During the period covered by the foregoing statement of renewals per month the company had 826 cars equipped. Attention is called to the increased renewals per month for the period from Oct. 1 to Oct. 31. This increase was caused by experimenting with a type of lamp having a special winding. These windings failed rapidly during October.

As already stated, careful attention was paid to determining the energy consumption for the different types of lamps under actual running conditions. On an 1800-hour basis, using four circuits of five 16-cp lamps and one circuit of five 32-cp lamps, the tantalum lamps compared with carbon lamps of like candle-power show an energy saving of 1726 kw-hours per car at the switchboard, or practically 1 kw per car lower in demand during the lamp-burning period. Comparing the energy demand from a car burning 25 16-cp tantalum lamps with a like equipment of carbon lamps, an energy saving of 1301 kw-hours on the basis of 1800 hours' lamp-burning during the year is shown at the switchboard. During a test of 600 car months the renewals with carbon lamps were found to be 4.269 per car month and with tantalum lamps 2.21 per car month.

FT. DODGE, DES MOINES & SOUTHERN RAILROAD STUDYING ELECTRIFICATION

The engineers of the Ft. Dodge, Des Moines & Southern Railroad, in conjunction with the engineering departments of the General Electric Company and the Westinghouse Electric & Manufacturing Company, are making studies of the possibilities of electrification on a 1200-volt to 1800-volt basis. This road is 84 miles in length and handles a large freight traffic by steam locomotives. Homer Loring, Boston, receiver for the company, states that plans and estimates are being prepared for consideration, including a possible change of the freight handling from steam to electricity. No decision has as yet been reached, however, as to the final policy regarding electrification.

DISCUSSION BY RAILWAY COMMISSIONERS ON RATES AND VALUATION

In the issues of the *ELECTRIC RAILWAY JOURNAL* for Nov. 26, and Dec. 3, 1910, abstracts were published of the reports of various committees presented at the convention of the National Association of Railway Commissioners at Washington, D. C., from Nov. 15 to 17. At this meeting the delegates voted that the reports of the committees on rates and rate making and on railroad taxes and plans for ascertaining the fair value of railroad property should be discussed together. An abstract of the discussion on these subjects follow:

Milo R. Maltbie, New York Public Service Commission for the First District, said in discussing the report that there may be various kinds of value, but to say that there was a market value for one thing and a market value for another brought up the purpose of that valuation. It seemed to him that it was necessary to know the purpose of valuation in determining what the fair value of the property is. If the State was going to condemn property of a corporation under the process of condemnation there would be one value, and certainly, under the decisions of the United States Supreme Court, in a determination of the fair value of the property for rate-making purposes there would be a different thing; and in a determination of the fair value of the property for bargain and sale between a man who wished to sell or who was willing to sell and a man who was willing to buy there would be an entirely different thing, because the Supreme Court had definitely stated that there are factors which may determine the value of property for bargain and sale which are not factors for determining the fair value of property for rate-making purposes.

J. C. Lawrence, Railroad Commission of Washington, said that the term "market value" was used in contradistinction to "physical value." The question went ultimately to that of the fair value of the railroad property, as indicated in the decision of the Supreme Court of the United States, in which it was held that the railways were entitled to a reasonable return upon the fair value of the property they were using in conducting transportation.

The "value of the service of the shipper" theory could only apply, Mr. Lawrence said, when the conditions of transportation were such that the carriers could not obtain a reasonable return on the particular commodity involved. Having found the value of the property, as a whole, and having divided that property so as to find what proportion of that value represented the use of that property for State purposes, there was shown the capital on which the company was entitled to a reasonable return for the conduct of its State business, the amount on which it was entitled to have a reasonable earning, as determined by the Supreme Court of the United States and by common sense and fairness of every man. To that reasonable return should be added all the cost of operating chargeable to State traffic. That would necessitate dividing the operating expenses applicable to State traffic and interstate traffic, and to that adding the reasonable contingencies. A railroad was entitled to a fair return, not only this year and next year, but during the period of its history, if it was exercising good judgment in the conduct of its transportation business. Such contingencies should be allowed as reasonable business men would insist upon having to guard them against contingencies of the future, ordinary and extraordinary, that might arise.

It was assumed in Washington that 7 per cent would be a reasonable return. Six per cent was the legal rate in that State, Mr. Lawrence said. Bonds sold at a much lower rate. But there was a hazard in going out into a new country and engaging in enterprises like that, and the commission did not want to erect any obstacle to railway construction. The question of efficient service was of more importance than the question of the rates to be paid. First was the question of efficiency, and second was the question of the rate. The "cost of service" theory could be applied to a schedule of rates on which the company was entitled to earn the return, but when it came to

the making of particular rates there was only one method, and that was virtually the method that had been pursued by the traffic department of the railroads—the application of common sense to the particular conditions under which the traffic moved.

Mr. Lawrence added that if some rates must, from the very exigencies of the transit business, be less reasonably remunerative some other rates must contribute to the burden that ought otherwise to have been borne by those rates; so that the rates of some commodities could not be made with reference to the cost of service. There must be that adjustment. The commission went into a very careful analysis of the cost of movement, State and interstate, in all the conditions under which substantially all of the commodities of that State moved, and included about 150 commodities in the investigation. It was found that it cost to move less-than-carload freight within the State substantially four times as much per ton per mile as it did to move less-than-carload freight on an interstate movement. The State haul was a short haul, and it had two terminal charges.

Halford Erickson, Wisconsin Railroad Commission, said that in Wisconsin the property of the railroads was valued for both rate-making and taxation purposes. In this State the rates of transportation made by the commission were largely made on the cost of the service to the carrier when this cost was made up on the operating expenses, including reasonable returns on the investment. While as a member of the committee on rates and rate making he agreed to its report, he did so more for the purposes of discussion than because the report as a whole represented his views in the matter. Personally, he did not attach the greatest of importance to the "value of the service" and other analogous theories of rate making. On the other hand, he regarded the "cost of the service" as of the greatest importance in this work. He was further inclined to hold that the methods suggested in the report for making reasonable rates fell short of adequately meeting the purposes for which they were intended. The law provided that the rates charged by public utilities should be reasonable, but it contained little that threw much if any light upon what this word "reasonable" really meant in this connection. The courts had gone somewhat further than this. In cases where adequate data had been furnished to them they had often held, in substance, that rates in order to be reasonable under normal conditions should yield revenues high enough to cover operating expenses, including fair returns on a fair value of the property used and useful in serving the public. This was also in the main the position of most of the commissions, whether expressed or not. The question of the cost of the service seemed to be inseparably connected with the question as to what constituted reasonable rates. The one was in a sense dependent upon the other. Public rate making should consist of an interpretation of these two terms. The "cost of the service," both in law and in fact, appeared to be the fundamental basis for rates. But in actual practice these principles did not seem to be regularly adhered to. The carriers or those who represented them, together with many, if not all, commissions, held that rates should be based on the "value of the service" and on "what the traffic can bear." There were some, however, who held that in the main the rates as a whole should be based on the "cost of the service," but that in adjusting the rates or costs between the various classes and commodities the value of these articles, the risks and other factors of this nature should be taken into consideration.

In order to determine the "cost of the service" it was necessary in time to value the roads and to determine the rate of the interest and profit to which they were entitled on this value, Mr. Erickson said. The processes involved were neither so costly nor so complicated as was sometimes supposed. When the valuation had once been made it was not hard to keep up. Nor would such valuations result in constant fluctuations in the rates, as was sometimes claimed. That public utilities should be, and, in the end, must be, so valued would seem to

be so obvious as to admit of but little in the way of doubt. That this valuation should be fair and that the returns allowed thereon for interest and profits should be reasonable was also clear. The public needed good service and adequate facilities in every way. Such service was costly, and this cost must be covered by the earnings. The railroad service must also be almost continually extended, and such extensions required new capital as well as business capacity. These could not be secured unless the returns were adequate. In the long run it was to the best interests of all concerned that the valuations placed on railroad property and the returns allowed thereon should be such as to attract both the necessary capital and the necessary business ability.

Milo R. Maltbie, New York Public Service Commission, First District, said the report upon valuation of railroad property used a term which seemed to him to be a very unfortunate one, the term "market value." The term that had ordinarily been used was "fair value." If the market value of the property was determined by the net income and if, on the other hand, the rates were determined by the market value of the property, the effect was to proceed in a circle.

On the other hand, Mr. Maltbie said, the market value of the property reflected not only the value of the physical property, but the value of the franchise. In the State of New York the commissioners were not allowed now to approve capitalization for franchise, except as cash may be paid to a legitimate local or State authority. To attempt to say that market value shall be the basis of rate making would introduce certain factors which should not be introduced. The report referred to a road which had been built into a country where the lumber was about to be exhausted and the value of the property therefore decreased. Depreciation ought to take into consideration not merely the question of age and wear and tear, but obsolescence, inadequacy, changed economic conditions, which would, perhaps, make a railroad unnecessary in a certain locality.

Mr. Maltbie added that the method of computing the value of the property had come up in a number of cases before the New York commission, and after considerable advising with leading engineers, not only in New York City, but in other cities, the plan recommended was to determine as one factor the scrap value. The committee suggested that discount should not be considered in determining the fair value of the property. That seemed to Mr. Maltbie to contain an economic fallacy. Assuming that a piece of property, a farm, was to be sold, was the cash value determined by the credit of the prospective purchaser? One man may have to give a larger note than another in order to purchase it, but did that indicate the farm was worth more? It seemed to him value was not determined by the credit of the farmer. It was determined by what the cash value of the farm would be. If the farmer had to discount his note it did not mean the value of the farm had gone up.

If 5 per cent bonds were issued to buy a piece of property they might have to be sold at a small discount. Four per cent bonds would require a larger discount, and yet, Mr. Maltbie asked, would the conclusion be proper that because of the larger discount on a 4 per cent bond the value of the property had gone up?

Mr. Lawrence, of Washington, said it was immaterial in one sense whether the term discount or brokerage was used. If bonds were sold at par, it cost something to market them. The amount of discount claimed by some roads was enormous. In Washington a reasonable allowance was made for such discount as would be encountered if there were a legitimate investment in the capital stock of the railroads. There was almost no investment in the capital stock of railroads in the State of Washington; they were built practically entirely from the proceeds of the sale of bonds.

After the conclusion of the discussion the association voted that the reports of the committees on railroad taxes and plans for ascertaining the fair value of railroad property and on rates and rate making be received and printed.

SOME ACCOUNTING FEATURES OF THE CLEVELAND RAILWAY COMPANY'S FRANCHISE

At the convention of the American Street & Interurban Railway Accountants' Association in Atlantic City on Oct. 10-14 a paper was presented by Henry J. Davies, secretary of the Cleveland Railway Company, on the subject "Some Accounting Features of the Cleveland Railway Company's Franchise." After the presentation of the paper Mr. Davies, upon returning to Cleveland, found several errors in the base tables and therefore compiled new tables which will be published with the paper in full in the proceedings of the convention.

As the earlier figures containing the errors were published in connection with the abstract of the paper contained in the issue of the *ELECTRIC RAILWAY JOURNAL* for Oct. 15, 1910, Mr. Davies has requested that the corrected tables, which show the operations of the Cleveland Railway System for the month of August in the years 1906 to 1910, inclusive, and for the period of six months ending Aug. 31 in the same years, be republished. They are therefore published herewith.

In the new tables a slightly different arrangement is made

from that followed in the tables published originally. The information, however, is the same.

By reference to the statements of the operations for the month of August it will be observed that the number of revenue passengers shows comparatively little increase from 1906 to 1909, but a very large increase in 1910. The total number of transfers collected fluctuated considerably. It was larger in August, 1907, than in the corresponding month of the previous year, but was smaller in 1908 than in either of the two preceding years. In 1909 the total was less than in August, 1907, but greater than in August, 1906 and 1908. The total in August, 1910, was larger than in any other of the months in which the returns were given and equaled 36.09 per cent of the number of revenue passengers. The total numbers of revenue car-miles fluctuated materially, both in passenger and in the other revenue car results.

Passenger earnings for August, 1908, were lower than those for any other months reported. This is due to the operation of the property by Mayor Johnson under a 3-cent fare and restricted service arrangement. Passenger earnings for August, 1909, were almost the same as in August, 1907. The total

OPERATIONS OF THE CLEVELAND RAILWAY SYSTEM

August	AMOUNTS				
	1906	1907	1908	1909	1910
Revenue passengers.....	11,058,499	11,723,872	12,391,090	12,697,763	15,597,858
Transfers collected.....	4,622,896	5,051,079	4,488,954	4,764,927	5,628,496
Total rides.....	15,681,395	16,774,951	16,880,044	17,462,690	21,226,354
Transfers—per cent of revenue passengers.....	41.80	43.08	36.23	37.53	36.09
Passenger car-miles.....	2,079,016	2,221,416	1,849,454	2,101,874	2,389,191
Other revenue car-miles.....	18,290	21,169	20,536	20,961	26,961
Total revenue car-miles.....	2,097,306	2,242,585	1,869,990	2,126,835	2,416,152
Passenger earnings.....	\$523,954.23	\$553,393.82	\$409,261.99	\$554,178.57	\$536,400.9
Gross earnings from operation.....	\$536,257.56	\$566,005.00	\$419,083.75	\$571,942.55	\$554,055.04
Operating expenses.....					
Operation of power plant.....	\$27,717.63	\$34,219.84	\$28,885.97	\$33,917.38	\$40,641.94
Operation of cars.....	125,931.23	135,648.95	134,203.14	144,853.27	195,077.49
General expenses.....	48,195.23	40,344.73	29,334.01	36,823.72	44,704.96
Total.....	\$201,844.09	\$210,213.52	\$192,423.12	\$215,594.37	\$280,424.39
Maintenance (reserve).....	143,400.58	142,845.91	93,872.30	112,228.67	144,969.12
Total operating expenses.....	\$345,244.67	\$353,059.43	\$286,295.42	\$327,823.04	\$425,393.51
Taxes.....	21,351.08	23,585.49	22,525.03	25,921.96	29,367.76
Expenses and taxes.....	\$366,595.75	\$376,644.92	\$308,820.45	\$353,745.00	\$454,761.27
Interest on bonds and floating debt.....	\$39,296.82	\$40,091.67	\$40,046.67	\$38,589.22	\$38,126.99
Wages of motormen and conductors.....	\$104,204.95	\$113,836.95	\$96,658.42	\$115,939.00	\$158,380.65

August	PER CAR-MILE				
	1906	1907	1908	1909	1910
Per passenger car-mile.....					
Fares.....	5.319	5.278	6.7	6.04	6.529
Transfers collected.....	2.224	2.274	2.43	2.27	2.356
Total rides.....	7.543	7.552	9.13	8.32	8.885
Passenger earnings.....	25.20 cts.	24.91 cts.	22.13 cts.	26.37 cts.	22.45 cts.
Per revenue car-mile.....					
Gross earnings from operation.....	25.57 cts.	25.24 cts.	22.41 cts.	26.89 cts.	22.93 cts.
Operating expenses.....					
Operation of power plant.....	1.32	1.52	1.54	1.59	1.68
Operation of cars.....	6.00	6.05	7.19	6.82	8.08
General expense.....	2.30	1.80	1.56	1.73	1.85
Total.....	9.62	9.37	10.29	10.14	11.61
Maintenance (reserve).....	6.84	6.37	5.02	5.27	6.00
Total operating expenses.....	16.46	15.74	15.31	15.41	17.61
Taxes.....	1.02	1.05	1.20	1.23	1.22
Expenses and taxes.....	17.48	16.79	16.51	16.64	18.83
Interest on bonds and floating debt.....	1.87	1.79	2.14	1.81	1.58
Wages of motormen and conductors.....	4.97	5.08	5.17	5.45	6.56

August	CENTS PER REVENUE PASSENGER				
	1906	1907	1908	1909	1910
Passenger earnings.....	4.73	4.72	3.30	4.36	3.46
Gross earnings from operation.....	4.85	4.83	3.38	4.50	3.57
Operating expenses.....					
Operation of power plant.....	.25	.29	.23	.27	.26
Operation of cars.....	1.14	1.16	1.08	1.14	1.26
General expense.....	.44	.34	.24	.29	.29
Total.....	1.83	1.79	1.55	1.70	1.81
Maintenance (reserve).....	1.29	1.22	.76	.88	.93
Total operating expenses.....	3.12	3.01	2.31	2.58	2.74
Taxes.....	.19	.20	.18	.20	.19
Expenses and taxes.....	3.31	3.21	2.49	2.78	2.93
Interest on bonds and floating debt.....	.36	.34	.32	.30	.24
Wages of motormen and conductors.....	.94	.97	.78	.91	1.02

passenger revenue for August, 1910, notwithstanding the increase of over 4,500,000 revenue passengers, as compared with August, 1906, showed a gain of less than \$12,500 in this period. The total operating expenses, including the maintenance reserve, were at their largest point in August, 1910. They were at their lowest point in August, 1908. In the former month they reached 76.8 per cent of the gross earnings from operation and in the latter month they were 68.3 per cent.

PERCENTAGE OF CHANGES

The following figures show the percentages of change in the six months ended Aug. 31, 1910, as compared with the corresponding period for 1906:

The increase in number of revenue passengers in 1910 over 1906 was nearly 40 per cent, while the increase in passenger car-miles was but 12.1 per cent, and the increase in passenger earnings but 1 per cent.

The number of revenue passengers per car-mile increased in the four years 24.62 per cent, while the passenger earnings per car-mile decreased 9.89 per cent.

While the amount of passenger earnings increased, as stated,

1 per cent, and the passenger earnings per car-mile decreased 9.89 per cent, the passenger earnings per revenue passenger decreased 27.54 per cent.

Wages of conductors and motormen increased 36.32 per cent in amount and 21.4 per cent per car-mile and decreased 2.1 per cent per revenue passenger.

The number of passengers per car-mile, including transfers and cash fares, in 1906 was 7.348 (or 7348 per 1000 car-miles, if it is preferred not to divide a passenger); in 1910, 8.819, an increase of 20 per cent. That is to say, the company was carrying 20 per cent more people per car-mile in 1910 than in 1906, indicating either extravagant service in 1906 or inadequate service in 1910. There was no material difference in size of cars.

The corresponding figures for August are as follows:

	Per Cent
Increase in revenue passengers.....	41.05
Increase in passenger car-miles.....	14.92
Increase in passengers per car-mile.....	22.74
Increase in number of rides per car-mile.....	17.79
Increase in amount of passenger earnings.....	2.37
Decrease in passenger earnings per car-mile.....	10.91
Decrease in passenger earnings per passenger.....	26.85
Increase in amount of platform wages.....	52.00
Increase in platform wages per car-mile.....	31.99
Increase in platform wages per revenue passenger.....	8.51

OPERATIONS OF THE CLEVELAND RAILWAY SYSTEM

Six Months Ended August 31	AMOUNTS				
	1906	1907	1908	1909	1910
Revenue passengers.....	62,334,042	67,435,302	67,163,189	72,970,140	87,059,441
Transfers collected.....	24,009,806	27,260,725	20,149,324	25,467,137	29,108,231
Total rides.....	86,343,848	94,696,027	87,312,513	98,437,277	116,167,672
Per cent transfers to revenue-passengers.....	38.52	40.42	30.00	34.90	33.43
Passenger car-miles.....	11,750,147	12,537,126	11,376,560	12,075,277	13,171,598
Other revenue car-miles.....	90,954	95,997	97,863	105,685	125,076
Total revenue miles.....	11,841,101	12,633,123	11,474,423	12,180,962	13,296,674
Passenger earnings.....	\$2,944,934.49	\$3,013,865.42	\$2,502,722.71	\$3,177,236.38	\$2,974,460.26
Gross earnings from operation.....	\$3,011,574.74	\$3,080,751.72	\$2,570,717.05	\$3,255,194.94	\$3,065,887.90
Operating Expenses:					
Operation of power plant.....	\$177,138.00	\$178,516.94	\$217,304.05	\$210,653.55	\$236,496.09
Operation of cars.....	722,059.77	780,309.62	778,805.23	846,340.61	1,010,827.45
General expense.....	223,923.44	238,066.32	178,813.30	223,789.22	259,499.92
Total.....	\$1,123,121.21	\$1,196,892.88	\$1,174,922.58	\$1,280,783.38	\$1,506,823.46
Maintenance (reserve).....	829,490.83	804,791.74	573,721.15	633,223.32	672,447.04
Total operating expenses.....	\$1,952,612.04	\$2,001,684.62	\$1,748,643.73	\$1,914,006.70	\$2,179,270.50
Taxes.....	126,052.51	130,362.85	135,316.62	151,435.65	169,713.49
Expenses and taxes.....	\$2,078,664.55	\$2,132,047.47	\$1,883,960.35	\$2,065,442.35	\$2,348,983.99
Interest on bonds and floating debt.....	\$234,338.90	\$241,056.26	\$233,432.74	\$232,765.65	\$222,921.18
Wages of conductors and motormen.....	\$591,738.05	\$644,773.07	\$599,000.03	\$661,268.98	\$806,673.55

Six Months Ended August 31	PER CAR-MILE.				
	1906	1907	1908	1909	1910
Per passenger car-mile.					
Fares.....	5.304	5.379	5.904	6.043	6.609
Transfers collected.....	2.044	2.174	1.771	2.109	2.210
Total rides.....	7.348	7.553	7.675	8.152	8.819
Passenger earnings.....	25.06 cts.	24.04 cts.	22.00 cts.	26.31 cts.	22.58 cts.
Per revenue car-mile.					
Gross earnings from operation.....	25.43 cts.	24.39 cts.	22.40 cts.	26.72 cts.	23.06 cts.
Operating expenses:					
Operation of power plant.....	1.50	1.41	1.89	1.73	1.78
Operation of cars.....	6.10	6.18	6.79	6.95	7.60
General expense.....	1.89	1.88	1.56	1.84	1.95
Total.....	9.49	9.47	10.24	10.52	11.33
Maintenance (reserve).....	7.	6.37	5. #	5.20	5.06
Total operating expenses.....	16.49	15.84	15.24	15.72	16.39
Taxes.....	1.06	1.03	1.18	1.24	1.28
Expenses and taxes.....	17.55	16.87	16.42	16.96	17.67
Interest on bonds and floating debt.....	1.98	1.91	2.03	1.91	1.68
Wages of conductors and motormen.....	5.	5.10	5.22	5.43	6.07

Six Months Ended August 31	CENTS PER REVENUE PASSENGER				
	1906	1907	1908	1909	1910
Passenger earnings.....	4.72	4.47	3.73	4.35	3.42
Gross earnings from operation.....	4.83	4.57	3.83	4.46	3.52
Operating expenses:					
Operation of power plant.....	.28	.26	.32	.29	.27
Operation of cars.....	1.16	1.16	1.16	1.16	1.16
General expense.....	.36	.35	.27	.31	.29
Total.....	1.80	1.77	1.75	1.76	1.72
Maintenance (reserve).....	1.33	1.20	.85	.86	.77
Total operating expenses.....	3.13	2.97	2.60	2.62	2.49
Taxes.....	.20	.19	.20	.21	.20
Expenses and taxes.....	3.33	3.16	2.80	2.83	2.69
Interest on bonds and floating debt.....	.38	.36	.35	.32	.26
Wages of conductors and motormen.....	.95	.96	.89	.91	.93

FREIGHT AND EXPRESS TRAFFIC DISCUSSED IN NEW ENGLAND

The regular monthly meeting of the New England Street Railway Club was held at the American House, Boston, on the evening of Nov. 30, with President Hile in the chair. Electric express and freight service was the topic discussed, with special reference to New England possibilities. The first speaker was C. V. Wood, vice-president of the Electric Express Company and traffic manager of the New England Investment & Security Company, Springfield, Mass. He was followed by George H. Dunford, general express and freight agent, Old Colony Street Railway, Brockton, Mass., and C. T. Battey, manager of the electric express department of the Union Street Railway, New Bedford, Mass.

Mr. Wood stated that the possibilities of electric express service are almost unlimited, and that cheap and prompt transportation is the keystone in the commercial arch. Nothing else has had such influence in the progress of states and nations. A transportation agent should not be allowed to perform only a part of his logical duty. The United States Department of Agriculture has estimated that in twelve products 43,000,000 tons valued at \$73,000,000 were hauled by team in a year an average distance of from 7 to 10 miles between the point of production and the shipping point. Here is a great source of waste, and a saving of even 10 per cent would be most impressive. Passenger traffic is no longer sufficient for electric railways. The extension of lines across country has imposed new duties upon the companies. Mr. Wood said that some towns had met the Electric Express Company with open arms, while others had exhibited opposition which was distinctly hurtful to the communities which ought to be enjoying such service. The company operates in the Berkshire, Springfield and Providence-Attleboro districts, and is extending the service as fast as practicable. Southbridge is a Worcester town, but on account of the attitude of Worcester toward electric express service the larger share of Southbridge trade is with the City of Springfield, which is much farther away. An express car runs daily between Springfield and Southbridge with 20,000 lb. of Springfield goods on board, and in many of the rural districts served by the company a haul of 10 miles by team is saved by the electric express facilities. The company has 17 box and 7 flat cars, and 3 electric locomotives, and last year it operated 155,000 car miles in express service. The charges are slightly higher than the regular freight rates. Mr. Wood also described the work of the "trolley farming special" which was run over the central Massachusetts lines in the spring of the present year and said that good results have come out of this undertaking. He concluded with a brief discussion of the importance of uniformity of methods in trolley express extensions and touched upon the need of cutting down the cost of terminal labor. He inclined toward the straight haul with warehouse receipt and delivery. The cost of terminal handling varies from 7 cents to 40 cents per ton, according to local conditions.

Mr. Dunford reviewed his early experiences in the express business in central New York, where quick service and convenient schedules enabled the company to compete successfully with four old-line express companies, four steam roads and four steam packets on the Erie Canal, in addition to the overland team expresses. The Utica & Mohawk Valley Railway Company started this service in a very small way and had an express and a commodity rate. The express rate provided for pick-up and delivery by teams and the commodity rate provided for delivery at destination only. The first three months' receipts showed a deficit, but by constant soliciting and advertising and superior service the business was put on a paying basis in one year and has since grown steadily. After three years the electric express department was handling 90 per cent of the business in the territory.

In 1906 Mr. Dunford joined the staff of the Old Colony Street Railway and spent three months studying the conditions. He found that in the southern part of Massachusetts the facilities between Providence, R. I., and points on the company's

lines were very poor. A service was first installed between Providence and Taunton and it became popular at once with the merchants. A circular letter was used, traveling salesmen were sent to cover the territory and two round trips daily were started, as the bulk of the business was perishable freight. Later, merchants in Taunton sent their buyers to Providence in the early morning, and prompt shipments were made back in time for the forenoon trade. This enabled the local merchants to carry a smaller stock, and an afternoon car provided for replenishing short stocks before the end of the day. The service has been extended and to-day the company operates between 38 cities and towns and has nine cars in regular service with three extra cars. [The company is now engaged in designing express cars of light weight without sacrifice of strength.—Eds.] A three-rate proposition is used, "A," "B" and "C." The "A" rate is for express service and provides for the collection and delivery by teams of all express matter, as with the old-line companies. The "B" rate provides for delivery at one end only. "C" provides a freight service which does not include team service at either end. These rates are governed by the official classification and class rates. The collection and delivery work is done by local expresses on a commission basis.

At Taunton the company has a concrete warehouse, 120 ft. x 40 ft., with facilities for car service on one side and team service on the other. Four cars and eight teams can be handled at once. At Brockton the company has a wooden warehouse built on practically the same plan. The capacity of both terminals permits handling 120 tons of freight per day. In the smaller towns the company has warehouses, and in the country districts platforms and buildings near the track, which are provided with portable runways which enable the crews to truck direct from the car to the building. New business is being created from the farmers, truck gardeners and milk producers. Long trips by wagon of many hours' night work are avoided and by the use of cars with open bulkheads in the summer season berries are kept cool in transit and from 2 cents to 6 cents more per quart are received for such shipments by electric express. Open-bulkhead cars are also used for live-stock shipments. A saving of from 12 hours to 24 hours is made on shipments of horses from livery stables, nine horses per car being the allowance. Each car has a portable runway. Foundry products are also handled successfully. Mr. Dunford closed with a short discussion of the benefits of electric express service to the farmer, particularly with reference to the elimination of team service on the highways.

Mr. Battey reviewed the electric express development of the New Bedford & Onset Street Railway, which started in 1902 under special legislative sanction. Previous to the establishment of this service it was necessary to team products 1½ miles to the freight station in Fairhaven, with a resulting freight train service often taking three or four days to reach the point of destination. There was no local delivery in the towns reached by the company. About 90 per cent of the business is sidewalk delivery. The ease of communication has enabled New Bedford merchants to compete successfully with Boston houses, and in the construction of summer residences in the Buzzards Bay district New Bedford contractors underbid Boston competitors. Conductors of express cars receive orders for goods from anyone on the line. These are assembled by telephonic advices at the urban end of the run and are shipped in a few hours to the purchaser. The rates charged cover the entire service. This service has tended to increase passenger receipts and to divert shopping patronage from Boston to New Bedford.

The success of the New Bedford & Onset service encouraged the Dartmouth & Westport Railway in 1903 to open a similar service between New Bedford and Fall River, with a schedule of three round trips daily. This schedule has since been increased to six round trips. The franchise forbids picking up or delivering goods on the sidewalks within either city. A notable stimulation in trade between New Bedford and Fall River has resulted from the establishment of electric express service. Large shipments of textiles are handled and goods which for-

merly occupied two days in transit now pass in as many hours. Dealers doing business in both cities who have a large sale of certain kinds of goods in one city and a small sale in the other ship in carload lots to the city where the larger sale exists and send the smaller quantities to the other city by electric express, thus saving much time and expense. Four round trips are made daily between Fall River and Providence and one daily between New Bedford and Providence, the latter being express without local stops in the run of 33 miles. The business of this line is in direct competition with a steamboat service between Providence and Fall River, and although the express rates are about 2 cents per 100 lb. higher than the water rates and the terminal facilities in each city have not been sufficiently large to handle the business properly, the traffic has increased 150 per cent since the first year of operation. The steamboat company has a freight solicitor on the road all of the time. The objections raised by public officials in the beginning have all been dissipated by experience. No objection has been raised to the use of express cars in the streets. Immigrants from Portugal landing at New Bedford are distributed throughout southeastern Massachusetts by trolley, and electric express is used to transport their baggage.

Mr. Battey stated that the percentage of loss and damage on goods carried by electric express is very small on account of the elimination of transferring in transit and the further point that the cars are loaded and unloaded by the crew, who must of necessity be careful men of good judgment. Mr. Battey gave it as his opinion that the present plan of handling electric express traffic by daylight will ultimately give way to night service, when the conditions are favorable to fast running, with no obstructions by passenger cars and no delays in waiting for passenger traffic. By this method goods can be shipped late in the afternoon for arrival at destination early the next morning and longer hauls can be made. As a result of electric express service a large part of the buying formerly done by New Bedford and Fall River merchants in Boston is now done in Providence. The merchants can do business on a smaller amount of capital on account of the facilities which allow them to replenish their stocks more quickly. Eight double-truck cars are now in service on the New Bedford express lines, with modern freight houses. Those in New Bedford and Fall River have over 5000 sq. ft. of floor area for freight purposes in each case, with track space for 10 cars, the total investment being about \$130,000.

DISCUSSION

H. B. Potter, Boston Elevated Railway, emphasized the advantages of a flexible schedule in electric express service and pointed out the benefits of being freed from the necessity of running cars on short and fixed headways. He considered that the solicitation of patronage is an important phase of such work and trained business experts are needed to secure the traffic.

E. E. Potter, Stone & Webster, Boston, formerly manager of the New Bedford lines and later manager of the Seattle Electric Company, stated that the New Bedford management tried in the early days to avoid every dollar of investment in freight business, as it desired to build up the service on the minimum possible capital. He thought that the striking increase in population of New Bedford since the last census might be in part due to the benefits of electric express service. He described the handling of freight on the Seattle lines, emphasizing the character of the business as from warehouse to warehouse, with no picking up en route. Loaded freight cars were electrically hauled from the steamship docks and railroad terminals to industrial plants located off the railroad, with great benefit to the manufacturers. Cars of 60,000-lb. capacity were hauled loaded on 13 per cent grades in Seattle. This business amounted to about \$10,000 per month, and was largely within the city. Mr. Potter spoke of the benefits of night service and of the economy with which such traffic can be handled when the system, crowded with traffic in the day time, is relatively free. He considered soliciting a good thing where the backers of the enterprise will put up the necessary money. In New Bedford soliciting was done in the early days, but a satisfied customer is the

best solicitor. In closing Mr. Potter said that the co-operation of the transeontinental railroads had been a decided help in Seattle and that the co-operation of the railroads would affect local trolley express conditions in Massachusetts to a large extent. He felt that the field in New England is as yet scarcely touched.

Matthew C. Brush, assistant to the vice-president, Boston Elevated Railway, and recently general manager of the Buffalo & Lake Erie Traction Company, emphasized the difficulties of handling interstate electric freight service under the supervision of the Interstate Commerce Commission and of the two State commissions of New York and Pennsylvania. Regulation tended to run to excess under such conditions, notably in connection with the filing of tariffs, methods of doing business, etc. He pointed out the importance of terminal location and arrangement and urged the closest study of labor costs in electric express service. The terminal must be convenient for shippers and consignees and also such as to facilitate entrance to and egress from cars. He favored handling the business on the basis of transportation on the company's lines from warehouse to warehouse only. On the Buffalo & Lake Erie lines reliability and promptness of service were the telling points which made competition possible. The rates were about half-way between steam and express rates. A prohibitive rate was made on the fourth, fifth and sixth classes of commodities, which were too bulky and heavy for profitable transportation. The real revenue came from the package express business. On this a minimum rate of 25 cents was obtained. The operation of through cars and the reduction of handling to the minimum make for successful trolley express business. The best service justifies the retention of relatively high rates.

ANNUAL MEETING OF EXECUTIVE COMMITTEE MANUFACTURERS' ASSOCIATION

The annual meeting of the executive committee of the American Electric Railway Manufacturers' Association was held Friday, Dec. 9, in New York in the rooms of the American Electric Railway Association.

The committee passed upon the final reports of the several committees which had in charge the details of the exhibit and other arrangements at the recent Atlantic City convention.

The report of the secretary and treasurer showed a satisfactory cash balance on hand, and the report of the auditors indicated that the books of the association were properly kept and in satisfactory order.

The annual election of officers resulted as follows: President, C. C. Castle, manager railroad department, U. S. Metal & Manufacturing Company; vice-president in charge of entertainment, W. L. Conwell, Westinghouse Electric & Manufacturing Company; vice-president in charge of finance, C. S. Hawley, vice-president and general manager, Consolidated Car Heating Company; vice-president in charge of exhibits, K. D. Hequembourg, general sales agent, Walker & Bennett Manufacturing Company; vice-president in charge of relations with parent association, Henry C. Evans, Lorain Steel Company; secretary and treasurer, George Keegan, 165 Broadway, New York. The arrangements for the annual dinner, which is to be given at the Hotel Astor, in New York City, during the midwinter meeting of the American Electric Railway Association, were placed in charge of Mr. Conwell, vice-president in charge of entertainment.

A committee was appointed to consider the question of establishing a headquarters office for the association. This committee will report at the next meeting of the executive committee, which will occur in New York City on Jan. 27, 1911.

Plans are at present being considered for the electrification of a portion of the North Western Railway in the environs of St. Petersburg, Russia. It is proposed to build a power station for the development of the water-power of the Wolchow, and the scheme comprises the construction of a high-voltage line for the transmission of the electric current for other purposes.

MEETING OF THE CENTRAL ELECTRIC ACCOUNTING CONFERENCE

The third annual meeting of the Central Electric Accounting Conference was held at the office of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, on Dec. 10, 1910.

The meeting was called to order by the president, W. H. Forse, Jr., Indiana Union Traction Company, at 10:30 a. m. In the absence of L. T. Hixson, the secretary-treasurer, E. D. Gault, auditor of the Mahoning & Shenango Railway & Light Company, was selected to act as secretary of the meeting.

ADDRESS OF MR. FORSE

W. H. Forse, Jr., then made the annual address of the president, as follows:

"Time rings down the curtain on another year of activity for our association, a year in which much has been accomplished. In reviewing the work of this period I am impressed with one fact above others and that is the willingness of our members to contribute their time and energies to increase the value of the meetings. We owe much to the members who have served on committees and to those who have prepared the papers for discussion. On behalf of the conference I extend hearty thanks to all who have thus bent their shoulders to the wheel.

"During the year we held meetings at Dayton, Ft. Wayne, Detroit and Chicago. Interesting, instructive papers have been read and discussed, and if we were to give our idea of the value of the meetings we should probably enthusiastically indorse the sentiment of one member who said that he usually gets several new ideas at each meeting, any one of which would be well worth the time and expense required for attendance. Special mention should be made of the splendid work accomplished by the committee on uniform comparative statements. This committee has undertaken a work of some magnitude and deserves to be commended for the careful manner in which researches are being made prior to making recommendations.

"One feature of the year's work has been the publication of pamphlets containing the papers read at the meetings, which can thus be permanently preserved for reference purposes. In addition to the printing of these papers an alphabetical list of items of expense in the operation of electric railways has been compiled, attractively bound and distributed free of cost to our members. This has been favorably commented upon. In addition to supplying our own members we have sold copies, at a profit, to non-member companies all over the country, and orders are still being received by the secretary.

"We have agreeably combined business with pleasure in some of our meetings. This was especially true at the Chicago meeting, when our genial host, Mr. Thompson, took us to Milwaukee in a special car. Mention should also be made of the pleasant steamer trip in June from Toledo to Detroit, when President Swift, of the American Street & Interurban Railway Accountants' Association, was present and favored us with a speech.

"It has been the policy of our association to keep in close touch with the larger organization, which is now known as the American Electric Railway Accountants' Association. I trust that this policy will be continued. Each organization can benefit from the interchange of ideas, and we are engaged in a common purpose.

"The future of our association looks bright. In closing my administration and turning over the keys of office to my successor, I would commend certain things to his and your consideration.

"I wish to propose as an unwritten law or a common custom of this association that an executive officer of the association shall serve one term and no more. This should, in my opinion, be the general rule of all bodies of this character, where the members are equally competent to fill any position in the gift of the assembly. I believe that such a practice will keep our association live and vigorous for many years to come. Every member will feel that he has an equal opportunity to give his

best services to the association, and the rotation of service will continually infuse new ideas into the governing group known as the executive committee.

"The question of affiliation with the Central Electric Railway Association was carefully considered and thoroughly discussed at our Ft. Wayne meeting, but it was decided to take no action. The constitution and by-laws of the Central Electric Railway Association would require amendment in order to permit all of our members to come in under such a merger. Two members of our executive committee and several other members would be excluded unless such amendment were made, and it has, therefore, been decided to continue the present independent organization.

"The Central Electric Accounting Conference has made splendid progress during the short period of its existence, and I predict a continuation of this onward march. The accounting methods of our companies have been improved by the work accomplished at these meetings, but there is still much to do. I hope that as an organization we will continue to strive for the highest efficiency in electric railway accounting."

Norman McD. Crawford, president of the Mahoning & Shenango Railway & Light Company, welcomed the conference to Youngstown and to the courtesies of the company. President Forse appointed committees as follows: Resolutions, J. D. Maynes, E. L. Kasemeier, A. F. Elkins; nominations, E. D. Gault, A. J. Lamb and O. I. Davis.

A report of the committee on uniform comparative statements was then presented by S. C. Rogers, chairman; E. L. Kasemeier and C. E. Thompson. An abstract of this report follows:

REPORT OF THE COMMITTEE ON UNIFORM COMPARATIVE STATEMENTS

"Since the report of this committee submitted at your September meeting W. B. Wright, having severed his connection as auditor of the Indianapolis & Cincinnati Traction Company, resigned as chairman of this committee, which is very much to be regretted, not only by the other members of the committee, but also by the conference. Mr. Wright's known interest in this work of preparing a uniform comparative statement, his large experience and analytical mind made him peculiarly adapted to this work.

"His withdrawal from the committee, the appointment of another member in his place and the selection of a chairman have taken some time. Your new committee, in taking up this very important task, has had time to consider the subject only in a general sense, and more particularly as to the difficulties involved in preparing a form of comparative statement of operating and financial conditions that may be adopted as standard.

"For a number of years the classification of accounts adopted as standard by the American Street and Interurban Railway Accountants' Association was used quite extensively by electric railway companies, modified in a great many instances to meet the views of executive officers and to suit local conditions. It was not, however, until the Interstate Commerce Commission and several of the State commissions prescribed a classification of accounts that must be followed by companies coming under their immediate jurisdiction that the railway companies within the various States came to use the same classification of accounts, which goes to show that there must be compelling power to make effectual any form of comparative statement that may be adopted as standard by this conference.

"It is not simply a question of harmonizing the views of individual auditors represented in the conference membership, because we all know that the executive officers of the several companies which we represent are even more particular as to the nature of the information concerning operating and financial conditions and the manner in which it is shown on the monthly statements presented to them than they are as to the classification of accounts. Each executive operating official wants just such information as to operating and financial conditions as he can make use of and he wants it shown in the manner best understood by him.

"The first question that arises in the mind of the auditor just entering upon his duties is, 'What do the president, executive

committee and general manager want to know concerning the operating and financial condition of the corporation, and how should the information be shown? When that is determined he will so plan his work and that of his assistants as to produce such information in the form desired. The auditor should, in addition, present to the executive officers such information as he considers essential whether required or not; he should not, however, present statistical information which is not put to practical use by the executive officers.

"What is essential from the viewpoint not only of the executive officers, but also of the auditor, and how these essentials shall be shown, is in brief the task committed to this committee.

"How to get in close touch with the needs and requirements of each of the railway companies represented in this conference and to harmonize all these factors, evolving therefrom a form of comparative statement for satisfactory use by each of our member companies, is a question this committee would like to present for discussion at this meeting, feeling that a free expression of individual views along this line will assist materially in this work.

"It might be an easy matter to lay out a comparative form of statement which might meet the views and needs of the members of the committee, but how about the executive operating officer, who because of the nature of his position with the company must use the information to the end that the business of the company may be economically and efficiently managed?

"Some one may suggest a plan whereby this committee may be able to obtain the views of the executive officers and operating officials of the railway companies on what they consider essentials in a comparative statement showing operating and financial conditions.

"In recording the actual facts concerning the operation and finances of a railway corporation, and in furnishing such information to the president, executive committee or general manager of the company, the auditor adopts those methods that he considers best suited to the local conditions, and that furnish the information desired by his executive officers.

"If this committee could get at a reason why a certain form of statement was used and why the executive officers want that information in just such a way, it would materially assist in this work. We bring this matter before you hoping that the members will express their individual views freely as to how to get this information into the hands of the committee, that in the end a form of comparative statement may be evolved that will give the auditor what he wants to show concerning the facts of operation and financial transactions recorded and also furnish to the executive officers of the several railway companies represented what they want to know and in a form that is of value and that will be used."

Following the presentation of the report of the committee a discussion took place which showed that it was necessary that the needs and wishes of executive and operating officials be taken into consideration. A number of the auditors present had prepared, at the request of the executive officers, statistical statements which were not put to any use. In most of these instances the reports were prepared for special purposes and the accounting departments continued to furnish them from day to day or week to week or month to month, learning subsequently that the information was no longer needed.

As a result of this discussion it was decided to address letters to the principal executive officials of the various member companies asking them to state their desires by letter as to the character of the information wanted in relation to the operating and financial conditions. This was done with the idea of getting the definite views of the various individual operating officers and with the feeling that only in this way could the accounting officers formulate a comparative statement of operating and financial conditions that might be adopted subsequently as standard. Among those who took part in the discussion on this subject were Mr. Crawford, Mr. Maynes, Mr. Kasemeier, Mr. Elkins and others.

The report of the executive committee was then presented by

Mr. Elkins. The report commended the address of President Forse and also referred to the publication of the alphabetical list of items of expense in connection with the standard classification of accounts. The report, in part, was as follows:

"One important point which might be mentioned is the alphabetical list of items of expense in connection with the classification of accounts adopted by the American Electric Railway Accountants' Association. Your conference decided to have the items of expense printed and distributed to member companies as well as non-member companies at a small expense to them, and the result has been more than expected, as from 50 circular letters which were sent out by the secretary 69 copies were sold. The secretary reports that he has sent out 50 additional circular letters. The conference has never done anything better to justify its existence and work than the preparation of these pamphlets. We have had numerous letters of commendation and much good sentiment expressed in favor of the conference, and your executive committee recommends that this good work be kept up and that the alphabetical items of expense be re-issued from time to time as demands justify.

"Your secretary is not with us to-day, but he reports ample funds on hand to care for the needs of the conference, and, therefore, we are in excellent financial condition."

A. J. Lamb, chief clerk of the Toledo Railways & Light Company, then read a paper on the subject of "Shop Accounts." An abstract of this paper follows.

MR. LAMB'S PAPER ON "SHOP ACCOUNTS"

"The primary object of a system of shop accounting is to furnish detail information as to the cost of work done at the shops. Some classes of work are done time after time; if definite records of the cost of such work are kept an average cost will be established in time and the knowledge thus acquired will make economies possible. A proper method of accounting will also determine the efficiency of different material and supplies, and, properly carried out, will determine at what time the cost of maintenance of equipment became so large that it should be discarded and new equipment purchased.

"The secondary object is to permit the comparison of work done at one shop with the results obtained at another. In order that these comparisons may be of value it is necessary that the method of figuring these costs be uniform.

"There are three elements of cost to be considered: labor, material and expense.

"It is unusual in street railway shop accounting to apportion in detail the overhead expense, which leaves it necessary to treat of labor and material only. Labor cost can be obtained without great effort.

"Each employee should be required to fill out daily a time ticket giving the car number, order number, description or classification of all work for the day. This ticket should be checked by the foreman and O. K.'d by him before it is turned over to the timekeeper. The timekeeper should summarize these tickets each day and check them with the payroll. Many shops are now using time clocks, and some require the employee to register his ticket at the time clock whenever he finishes a piece of work and again as soon as the foreman assigns him to another job.

"Material should be drawn from the storeroom only upon a regular storeroom requisition, properly approved by the foreman of the department where material is to be used. This order should not be filled by the storekeeper unless properly approved with the car number, classification, shop or manufacturing order number. Where material has been drawn and not used on the order or car number for which it was intended it should be returned to the storeroom and properly credited to that account.

"The shop order system gives a good record, is simple and should be used for work done by all departments. In the car shops it is used for car painting, repairing cars damaged by collision, annual overhauling, and for any special work on cars. Permanent shop order numbers may be used for the daily minor repairs. Work performed in the car shops for any other department should also be recorded on shop orders.

"Labor and material used on work of this description should be directly charged against each particular shop order number, which in turn is closed into the proper account. When a car is received in the shops it should be tagged with a card showing the work necessary to be done thereupon. A shop order in duplicate, with a serial number, should be issued immediately. The original, after being approved by the manager, should be forwarded to the auditing department, and the duplicate returned to the shops. This card should call for an estimate divided between labor and material for each division of the work. The charges against the shop order are made weekly on the reverse side of the card. When the order is completed a notification showing the completion of the work should be sent to the accounting department by the mechanical department.

"The advantages of the shop order system in a large company are apparent. It enables the manager to analyze his cost, and, by giving each job a permanent individuality, presents an excellent basis for comparison. It locates responsibility for the cost of each particular job and furnishes a basis for estimate of work yet to be done.

"In the plan of a large shop not enough care seems to be given in some designs to the logical location of the storeroom, with the result that the employees walk considerable distances for their supplies. Under these circumstances there is a great loss of labor time by both the messengers and their co-workers who are in need of the material to finish the job. We have a storeroom messenger; an annunciator is located in the storeroom and each department is numbered; the messenger answers the bell, gives the foreman of the department, where called, a requisition to fill out and returns for the material. The paint shop has a series of numbers for different material used, and on the order reports so many gallons of No. 2 or No. 3 or whatever material or quantity is used. The master mechanic has another card giving the labor and material used on cars for repairs and keeps it on file for future reference.

"The men's time is kept by the clock system, allowing 10 hours a day and a half hour for dinner.

"When the purchasing agent receives the bills he sends the original and duplicate to the storekeeper, who in turn checks them and returns to the purchasing agent. If the goods are not received, the storekeeper keeps the bills until the goods arrive and are checked.

"The storekeeper keeps an invoice file where he can refer back to any order at any time. As we have barns located in different parts of the city the storekeeper sets Monday, Wednesday and Friday on which the different depots can fill requisitions for the time intervening. This does away with confusion and the unnecessary time of going to and from the storeroom. Work train mileage, as well as labor, is charged to account No. 29 for storeroom supplies, unless some particular item is hauled for the shop, and then it is charged to account No. 9.

"The scrap is piled in separate heaps, according to material. When enough accumulates the purchasing agent disposes of it if the market is favorable for its disposal and gives the proper departments credit for the revenue derived."

Among those who took part in the discussion of Mr. Lamb's paper were Mr. Kasemeier, Mr. Young, Mr. Maynes and Mr. Werth, of the Mahoning & Shenango company.

At 12:30 o'clock the conference adjourned and went to the banquet room of the Young Men's Christian Association, where lunch was served. After the lunch Mr. Forse spoke on behalf of the conference and the following on behalf of the Mahoning & Shenango Railway & Light Company: Mr. Crawford, president; Mr. Randall, assistant to the president, and Mr. Rogers, treasurer. The conference was welcomed by M. J. Megown, secretary of the Youngstown Chamber of Commerce, and Edmund McDonald, Jr., secretary of the Young Men's Christian Association.

At the afternoon session A. F. Elkins discussed the subject of "Stores Accounting." He distributed the forms which he described. An abstract of the discussion of Mr. Elkins follows.

DISCUSSION ON "STORES ACCOUNTING," BY A. F. ELKINS

"You will all acknowledge that the storeroom has been a secondary consideration in the operation of electric railways in the past. Very little attention has been paid to it and great leaks have occurred by reason of this inattention. It has been given to the accountants to formulate a system of accounts for storeroom accounting. While they have no direct jurisdiction over the storekeeper aside from the accounting features, they must necessarily keep in very close touch with him. Mr. Forse, in his book on 'Electric Railway Auditing and Accounting,' brings that in very forcibly. If you have not a copy of that book I would recommend that you get it. He covers that field thoroughly.

"One of the few open questions to-day is the question of the authority of the auditor over the storekeeper. I find that most storekeepers are under the superintendent of motive power, master mechanic or some other operating head, and that the auditor has jurisdiction only through the accounting features. Our general manager, in an argument with me, said that the auditor should not have jurisdiction over the storekeeper because he was too far removed from the accounting department. He did not give any thought to the distance the agents along the line are removed.

"The requisition for supplies is made out either to the purchasing agent or the general manager and is signed by the head of the department and approved by the general manager, and then turned over to the purchasing agent. The requisition blanks are in book form and copies are numbered the same as the original blanks.

"The first copy of the official order is sent to the concern from which the material is purchased. The second copy is the purchasing agent's copy and is retained and filed with the requisition for supplies. The third is the storekeeper's copy. It is sent directly to the storekeeper and is retained by him to be checked directly against the invoice. The fourth is the auditor's copy.

"The material notification sheet is filled out, signed and sent to the storekeeper by the official who receives the material. This gives the storekeeper a complete record of every piece of material purchased on the system. Every invoice pertaining to the operation of the property must go through the books of the storekeeper, and so far as possible every invoice be charged to a material and supplies account and so audited through the auditing department.

"In the distribution of material we use a form called the requisition for supplies to the storekeeper. At the end of the day the master mechanic must fill out a requisition covering any small items that have been given on memorandum receipts. The storekeeper has the record and at the end of the day or the close of the week he fixes the price on the material and it is recorded. The form used for this purpose by the Scioto Valley Traction Company is not used by us. I want to commend it especially to the conference. It embraces a record of the storeroom for the day. The storekeeper there reports the transactions and forwards a signed copy to the auditor, who recapitulates his figures every day; and at the close of the month he has his storekeeper's report. Each sheet is numbered, the storekeeper keeps a copy and the record is complete. Some systems have a blank sheet, as we have, on which the storekeeper keeps his record. For instance, under any specific account he puts all of the material furnished and at the end of the month he has all of his material and the cost of that material. He takes these at different periods and enters them on his records. Importance is attached by some electric railways to loose-leaf devices for stock records. There is much to commend this system. However, I believe that a permanent book record is best.

"After the blank-sheet record has been compiled the storekeeper enters the material in the debit side of his book. At the close of the month he makes out a report to me. By this method the general manager can take the same report for the same month of the previous year and tell just exactly whether he is using more or less material, and what kind and why. This report is signed by the storekeeper and approved by the

superintendent of motive power, and the original is sent to the auditor and a copy to the general manager, and a copy retained by the storekeeper. This report is not made out until the books are closed by the storekeeper for the month. After the reports are made out the storekeeper has what might be called a perpetual inventory.

"I do not know of any more simple system than that we are using. I have tried to eliminate every feature from the system that would necessitate the employment of extra help and we have a system by which we can get results without going a long way around."

After the presentation of the paper a discussion took place which brought out various recommendations for improvements.

The subject of increase in membership of the conference was discussed. The president was authorized to appoint a membership committee of not less than three.

The committee on resolutions, composed of Messrs. Maynes, Kasemeier and Elkins, then made its report. The thanks of the conference were given to the Mahoning & Shenango Railway & Light Company for its hospitality. The committee advised that an honorary membership be created and W. B. Wright and M. W. Glover made honorary members. Mr. Glover was the first president of the conference and is now secretary of the Mobile Light & Railroad Company. The report was adopted.

The nominating committee then made its report, and the following officers were elected:

President, S. C. Rogers, treasurer, Mahoning & Shenango Railway & Light Company, Youngstown, Ohio; vice-president, C. E. Thompson, auditor, Chicago & Milwaukee Electric Railroad, Chicago, Ill.; secretary-treasurer, A. F. Elkins, auditor, Columbus, Delaware & Marion Railway, Columbus, Ohio; executive committee: A. J. Lamb, chief clerk, Toledo (Ohio) Railways & Light Company; F. K. Young, auditor, Seiotto Valley Traction Company, Columbus, Ohio; E. L. Kasemeier, auditor, Ohio Electric Railway, Springfield, Ohio.

The conference was invited by the Ohio Electric Railway to hold its next meeting at Springfield, Ohio. This will be submitted to members for vote by mail.

ILLINOIS COMMISSION CALLS CONFERENCE TO DISCUSS INTERURBAN OPERATING METHODS

Orville F. Berry, chairman of the Railroad and Warehouse Commission of the State of Illinois, has issued the following bulletin to all electric railway managers in Illinois.

"The very rapid growth of interurban railroads, and both passenger and freight traffic thereon during the last few years, has made them a very important factor in transportation, differing in many respects from the steam road; and the manner of operating them successfully and safely is one of the present important problems for solution. This commission is desirous of assisting in every way possible in the proper solution of this question and to bring about a system of operating that will be safe to the public and profitable to the roads.

"To that end you are most earnestly requested to be present yourself, and to bring such of your operating force as you may deem best, at a meeting of interurban managers and operating officers to be held in the rooms of the Railroad and Warehouse Commission in Springfield Tuesday, Dec. 20, 1910, at 10 a. m., for the purpose of an informal discussion of this or any other subject that may properly be brought before the meeting."

It is understood that increased safety of operation is to be the subject under discussion.

The record of passenger train performances on the various steam railroads in New York State for October, 1910, just issued by the Public Service Commission, Second District, shows that during the month 63,648 passenger trains were run. In October, 1908, there were run 57,712 trains; in October, 1909, there were run 56,230 trains. Eighty-two per cent of all trains were on time at the divisional termini.

CONFERENCE ON INTERURBAN OPERATION BETWEEN RAILWAY AND INDIANA STATE OFFICIALS

A conference between representatives of interurban railways and State officials of Indiana was held in the State House at Indianapolis, Ind., on Tuesday, Dec. 13, to discuss the subject of operation and proposed improvements. The meeting was attended by Governor Marshall of Indiana, at whose request it was called. Including the officials of interurban railways, 40 people were present.

Governor Marshall said that the meeting was called in order that he might have definite information regarding the present law and the interurban business situation and because of the fact that unless full information regarding existing conditions is given the accidents which had occurred recently might lead to the passage of drastic statutes by the next Assembly. Although he desired to have additional safeguards provided for travelers, he would not pretend to say that the excitement which followed the recent accidents was justified. The Governor's clerk then read the report of the Railroad Commission of Indiana in relation to recent accidents.

Governor Marshall asked if there was any reason why a law should not be enacted making the violation of orders which resulted in loss of life a criminal offense.

Arthur W. Brady, president Indiana Union Traction Company, knew of no reason why steam and electric roads should not be on a parity in that respect.

Governor Marshall then called attention to the subject of obstructions to sight along interurban rights-of-way and said that the safety of operation would be increased if the obstructions were removed. He expressed the belief, to which the attorneys present agreed, that laws could be passed to enable the interurban roads to condemn obstructing property.

Senator Barrett said that the Ft. Wayne & Wabash Valley Traction Company had tried to condemn obstructions to sight at the point at which the Kingsland wreck took place, but that previous to this accident the company was unsuccessful.

Governor Marshall described the legislation of 1907 which provided that the Railroad Commission should investigate accidents, report to him and make recommendations designed to prevent a recurrence of them.

William J. Wood, chairman of the commission, said that the Supreme Court had not passed upon the legality of this legislation but that the railroads had met the requirements of the commission. On account of an imperfect statute, the commission had refrained from any mandatory action on this subject.

Charles L. Henry, president Indianapolis & Cincinnati Traction Company, stated for the roads that it was his understanding that it was proper for the commission to investigate accidents and make recommendations. If the roads did not follow the recommendations of the commission, the courts could then decide whether the orders were enforceable.

Governor Marshall spoke of four companies that had had accidents and of the recommendations of the commission which followed. From the testimony before the commission, the Governor formed the opinion that the roads thought that length of service for employees was not a guarantee of efficiency. While most men learned by experience, others never learned. He thought that while a road might expect that long service would make a man more competent, length of employment was not a prime factor in the efficiency of a motorman.

The Governor called attention to a rule book containing 95 printed pages, issued by a local road. He asked the managers if the grade of men employed could learn those rules thoroughly enough during three weeks' instruction to use them at critical times.

Mr. Brady said that the roads employed high grade men of ability and trustworthiness. The length of the period of instruction varied with the men and the rules were not complicated. Referring to a recent investigation of accidents and to testimony that a motorman did not know the rules, Mr.

Brady said that the methods of investigation might have been so embarrassing to the witness that a confused and ill-advised reply was given.

Charles L. Henry said that an unsatisfactory man might slip through in spite of the best system of preliminary investigation. He knew of no accidents that had happened in Indiana because of lack of knowledge of the rules by trainmen.

Another speaker called attention to the Kingsland accident, saying that the man responsible had operated the opposing train for 60 days and was therefore familiar with the entire situation.

Commissioner Wood referred to an investigation by the commission which tended to show the poor service of motormen, who had been found reading newspapers and talking while the car was running and not often looking at their watches and time tables.

A discussion of the recommendation that motorman have a train service experience of one year before handling a car followed. The companies objected to the recommendation because this experience was not a guarantee of efficiency and because of the difficulty of getting men.

Mr. Brady said that the hazards of the service had not caused a loss of employees.

Charles L. Henry said that his company had not lost any employees on account of the wages paid by automobile manufacturers or any feeling of danger which had arisen.

In reference to the suggestion that motormen have a railroad experience of one year, Mr. Brady read the section relating to this subject in the reply of the Indiana Union Traction Company to the letter of the Railroad Commission. The reply is published on page 1203.

Governor Marshall asked if Mr. Brady contended that each road should choose its own men independently, or should the State establish a grade of efficiency?

Mr. Brady said that the roads would not object to the establishment of such a grade and they would observe it if it were shown that the recommendations of the State would improve efficiency.

Governor Marshall asked if the railroads knew of any way in which the State could establish a grade of efficiency of men and make a rule that could be adopted generally for the State.

Mr. Brady said that it would not be advisable to adopt the plan unless the State had some real way of determining the character of a man. If there was a real way, the plan should be put into effect.

Governor Marshall said that, even eliminating the humanitarian consideration, he knew that no management would willingly employ inefficient men for trainmen and knowingly assume liabilities. He referred to existing legislation which prohibited the employment by steam roads of flagmen without one year's experience in railroading. He thought that it was characteristic in railroading as in life not to pay attention to causes until trouble resulted.

Mr. Brady discussed forcibly the comparative safety of travel on steam and electric trains. He called attention to the figures on this subject in the first part of his letter, reproduced in the following pages. He said that these figures required recognition. Mr. Brady held that the character of interurban trainmen was as high as or higher than that of steam railroad trainmen.

Governor Marshall replied that he took little stock in figures because they might have been determined from different premises. He called attention to the public excitement which followed recent accidents and asked if anything could be done or should be done to make the people feel easier. Accidents could not be prevented, but he was anxious to lessen them.

Mr. Brady spoke, he thought, for every road when he said that each one was determined to surround operation with every safeguard. Additional safeguards would be accepted willingly, but the roads should not be compelled to put a train in charge of a man long in the service when it was thought that the train would be safer with a man who had been in

the service a shorter time. The Indiana Union Traction Company would be glad to report to the commission regarding the selection of men if the commission wished to investigate the subject.

Commissioner Wood said that the selection of men was of the greatest importance and the roads should assume the responsibility therefor.

T. C. Reynolds, general manager, Kokomo, Marion & Western Traction Company, described the system of instruction on his line. A man was employed first on the city system and was advanced afterward to the extra interurban list, finally reaching a regular interurban run. If the commission should require an experience of one year for trainmen, 50 per cent would be added to the operating expenses because a student would have to be carried on a car.

Commissioner Wood interpreted the suggested one-year-in-train-service rule to mean work on an interurban train in any capacity or on a steam train. He thought that even if the rule was hard and fast the roads could get plenty of men.

Mr. Murdock, Chicago, South Bend & Northern Indiana Railway and Evansville & Southern Indiana Traction Company, disapproved the employment of steam railroad men, who sometimes regarded the interurban railroads as toys.

C. E. Morgan, general manager, Indianapolis, Crawfordsville & Western Traction Company, disapproved the promotion of conductors to the position of motormen. His experience of 11 years had shown him that conductors did not make the best motormen. The only serious accidents which had occurred were caused by motormen who had been promoted from the position of conductor. One railway manager objected to the one-year rule because it would require the employment of tramp steam railroad men.

Charles L. Henry read his answer to the commission regarding the recommendation that motormen should not assist in handling baggage. The reply was similar to that of the Indiana Union Traction Company shown in the following pages.

Mr. Brady read the reply of the Indiana Union Traction Company to the recommendation in reference to block signals. This is contained in the full reply of the company reprinted in the following pages. The company had 111 miles equipped with dispatchers' signals. Mr. Brady believed that they added to the safety of the lines and was ready to extend them on the order of the commission.

In a discussion which followed regarding the merits of dispatchers' signals various points were brought out which may be summarized as follows: Until recently the large signal companies had paid little attention to interurban roads. The manual block system suggested in the report of the commission was too expensive to operate, requiring a man at each block station. Present dispatchers' signals were good as aids to safety but did not provide full protection. The roads hoped for something better and within their means.

Commissioner Wood said that he would be satisfied if the roads would install signals similar to those of the Indiana Union Traction Company.

Governor Marshall said that if these signals were satisfactory now and, on the approval of the commission, the roads were ordered to install them at an assumed cost of \$200 per mile, and after a year they were found practically obsolete, it would not be fair to the roads to order their replacement with improved signals.

Commissioner Wood summed up the recommendations of the commission as follows: Employ men as motormen with not less than one year's experience. Do not give motormen other duties. Put in block signals. The discussion was confusing because no distinction was made by some of the speakers at the meeting between block signals and dispatchers' signals.

A. A. Shane, general manager, Indianapolis, Columbus & Southern Traction Company, asked if the commission would recommend the adoption of one system of signals. Commissioner Wood replied that it would. Mr. Shane said that if that course was to be followed much more time should be allowed for deliberation and investigation. Signaling was to come and

the signals adopted should overcome the weakness of men. Dispatchers' signals did not do this. In order to determine efficiency, Mr. Shane had contracted for the installation of one block of signals. The interurban roads were investigating the subject through the committee on signaling, of which Mr. Shane was chairman, and it had been found that numerous improvements were almost ready for installation.

C. N. Wilcoxon, general manager, Chicago, Lake Shore & South Bend Railway, regretted to express the opinion that the commission should not recommend one system alone. A system satisfactory for use on the Indiana Union Traction Company lines would not be satisfactory on his road because of single-phase operation. He thought that dispatchers' signals did not accomplish what the commission wanted. They were not block signals. He did not object to any particular manufacturer of signals but wished improvement.

Governor Marshall summed up the discussion and said that he had called the conference to get light in order to determine means of making travel safer and to avoid, in a fair way, additional drastic or foolish legislation which would surely follow if the railroads were not amenable to reason.

Commissioner Wood, replying to a question by Mr. McReynolds, said that on the Kokomo, Marion & Western Traction Company lines trains were operated hourly over 27 miles of track and a signal system would not be needed.

Senator Barrett expressed the thanks and appreciation of the railway representatives because the Governor had accorded them a public hearing and free discussion.

Governor Marshall thought it would be disclosed that the temper of the roads and the commission would be such that the improvements would be made if possible in any way, and that legislation was not needed to bring this about.

LETTER OF INDIANA UNION TRACTION COMPANY

Following is the letter sent by the Indiana Union Traction Company to the commission:

"The Indiana Union Traction Company submits the following response to the recommendations contained in your report to it dated Nov. 21, 1910, in relation to the accident north of Tip-ton on Sept. 24, 1910.

"This company, by way of preface, calls your attention to the fact that among the 60,451,000 passengers carried by it and its predecessors during the period from June 27, 1899, when the Union Traction Company of Indiana was first organized, down to and including Aug. 31, 1910, a period of 11 years, only two fatalities occurred through neglect of either company or employees. During the same period 80,756,000 city passengers were carried without fatality. The deaths among interurban passengers of the company for the period stated average one to 30,225,500 and among all passengers one to 70,603,500. During the period from 1900 to 1908 (the latter year being the latest for which the figures are accessible in the annual reports of the Interstate Commerce Commission) the average fatalities among passengers transported by carriers reporting to that commission varied annually from a maximum of one death to 1,375,856 passengers in 1905 to a minimum of one death to 2,335,983 passengers in 1908, or an average for the period of one death to every 1,837,974 passengers carried.

"This company does not claim that these figures bear directly upon the facts of the particular accident involved in your report, but it does claim that such figures conclusively demonstrate the safety in high degree of the methods of operation hitherto employed on the lines of this company. It follows that changes of an important character in such methods should be made or required only on a clear showing that the safety of the traveling public will be enhanced thereby.

"The following responses are in the numbered order of your recommendations:

"1. (a) Your recommendation that applicants for positions as motormen or conductors should not be employed until their former records have been carefully investigated and all letters of references and recommendations have been carefully con-

sidered conforms to this company's past and present practice, which it will continue to follow.

"(b) Your recommendation that no motorman should be hereafter employed unless he has had at least one year's experience in train service embodies the principle that, other things being equal, experience should increase the reliability, qualifications and value of a trainman. Such principle this company has always recognized and followed, and will continue to follow. This company will further adopt and follow, so far as may be practicable, your specific recommendation. This company does not believe, however, that the highly important and responsible position of motorman should be filled solely with regard to length of service. Cases have arisen, and are certain to arise again, where one man having an extended experience in train service would be a less competent and reliable motorman than another man of much less experience. For instance, an excellent conductor of long experience might not be as good a motorman as another man of comparatively short experience. In all such cases, where the rule you recommend cannot be followed without the selection of a less competent man and the rejection of a more competent man, this company, being directly charged with responsibility for the safe carriage of many hundreds of thousands of passengers each month, cannot undertake to adhere rigidly to the rule referred to.

"Your attention is called to the fact that the motorman at fault in the accident here involved was one of extended experience, to whom the rule recommended would have no application.

"Your attention is also called to the practical impossibility of adhering strictly at all times and under all circumstances to the rule recommended. Interurban companies have no extensive switching yards where employees may obtain actual experience in a certain kind of train service. They have no place where one man by watching and helping another trainman may obtain experience for a long period, as in the case of a fireman on a steam locomotive. In the limited space of the modern interurban passenger car are compactly placed a motorman's cab, baggage and express compartment, smokers' compartment and ladies' compartment, the functions of which in the case of a steam railroad require an entire train of locomotives and cars. To keep a man for an extended period on one of these interurban passenger cars where employees cannot be kept at a distance from one another as they can on a steam railroad train, for the purpose of learning the duties of trainmen by observation and the performance of such duties as can be incidentally imposed on him, would be an unwise and unsafe course. Such a man cannot be constantly engaged in work, and when not so engaged would be a source of distraction to and interference with other trainmen.

"A practice so filled with hazard should not be followed; moreover, training and experience obtained in this way would not be valuable. Furthermore, interurban companies could not rely with safety beyond a very limited extent upon securing for motormen men with one year's experience in steam railroad service. The experience of interurban companies varies, but this company has found that by reason of the difference in the two classes of service and the difference in the kinds of equipment handled steam railroad service sometimes serves to disqualify, rather than qualify, a man for interurban service. Some lessons which a steam railroad man has learned must be unlearned in interurban service. If, therefore, a rule should be adopted the practical effect of which was to compel the interurban companies to resort to men having one year's experience in steam railroad train service, the actual result would be the employment in many instances of men less efficient than those who might be selected from other fields.

"(c) Your recommendation that motormen shall not be required to assist in caring for baggage or express this company cannot accede to. The duties imposed on motormen in this connection require attention only when the car is at a standstill and not while the car is in motion. By far the greatest part of all baggage and express handled is taken on or let off at a few

stations, at the principal of which baggagemen are employed, so that comparatively little attention is required even at these points on the part of the motorman.

"The case of the motorman is entirely different from that of the locomotive engineer. Even while his car is in operation the motorman has none of the complicated duties to perform which require the constant attention of the engineer, as, for instance, attention to water and steam gages, lubrication, coal and water supply, etc. When the car is stopped the motorman has ordinarily no duties to perform with respect to the equipment of the car, while the engineer is required at such times, as well as others, to give his attention to the intricate machinery in his charge. The difference between the two is that the engineer is responsible at all times for the operation of a moving power plant, while in the case of the motorman the power is furnished to his car ready for use from a central power plant operated by experts.

"The adoption of the rule recommended would compel this company to impose the entire handling of baggage and express on the conductor alone—a task calling him away from the care of passengers and often beyond his physical ability, requiring the co-operation of both motorman and conductor as now—or to place on each of its cars carrying baggage or express an additional man, whose sole duty would be the handling of these articles. It is obvious that the expense of this last course would prohibit its adoption for the great majority of cars on which baggage and express are now carried, since on many of these cars the amount of baggage carried is very small, and such baggage is carried entirely for the accommodation of passengers, for whom it is generally important, and frequently essential, that the baggage be transported on the same car that carries the owner. This would compel the company to confine the carriage of baggage to a small number of cars to the great inconvenience of the traveling public and in violation of the act of March 8, 1907, as heretofore construed by you.

"The commission will bear in mind that the interurban companies of the State prior to the passage of the act referred to limited the carrying of baggage in all reasonable ways, feeling that with their limited baggage compartments the carriage of baggage was a burden and not a benefit to them. It was only after the commission had indicated to the interurban companies its view that the act referred to, which requires the carriage of 150 lb. of free baggage per passenger, with very low rates for excess weight, applied to interurban companies and had suggested the prosecution of interurban companies for violation of the act that the interurban companies changed their practice and adopted the view of the commission in that respect.

"This company would hesitate long before placing a baggageman on its cars unless the amount of baggage to be carried should be such as to engross his time completely from the beginning to the end of his run, so that he could not distract or interfere with the trainmen. An idle employee on an interurban car is a menace to safe operation.

"(d) Your recommendation that separate compartments be provided for motormen this company will comply with. It is and has been the practice of this company to exclude all persons, except those having duties to perform there, from the compartment of the car occupied by the motorman; and in the case of those cars in which the motorman is placed in a large compartment adapted also to the carriage of baggage and express it is and has been the rule of the company to exclude all passengers therefrom, except when absolutely necessary to accommodate passengers on special occasions. This rule we will now modify so that passengers will be excluded at all times from such compartment, although at times of heaviest travel, as, for instance, during the State fair, when our facilities are taxed to their full capacity, this modification will greatly inconvenience the traveling public.

"(e) Your recommendation that in case of a passenger trailer or other additional passenger car attached to a passenger motor car a third man shall be employed to work under the direction of the conductor this company will comply with, this according with our past and present practice.

"2. Your recommendation that this company proceed to in-

stall block signals this company is ready to comply with as soon as a satisfactory signal can be secured at an expense within the financial ability of the company to install and operate. From the conference held with the commission last week and from your report to one of the interurban companies we understand that the type of signal system now in use on the lines of this company between Indianapolis and Muncie and between Anderson and Wabash has the approval of the commission, and we are willing to extend this system over any of the lines of the company on which the commission desires that it be installed.

"We call attention, however, to the fact that at this time a number of signal systems are being presented for consideration, and that one or more of these may prove better than any practicable system now in use.

"We shall diligently pursue this subject, and shall be pleased to present, if possible, plans and blueprints to you by the time limited in your recommendation as modified, viz., Feb. 1, 1911.

"3. Your recommendation that this company shall enforce 'the double-order system of dispatching' on its lines this company is ready to comply with under a rule to be approved by the commission. We understand that the system now in use is what is known by railroad men as the 'double-order system,' but that the commission by the term means the system which requires both motorman and conductor to read back the order to the dispatcher. The commission will recognize the fact that the adoption of this rule is a departure from the method of dispatching which has heretofore been in such successful operation on the lines of this company, and approved by the commission, and no accident has been caused by any failure in the dispatching system used. It is, therefore, important that in the displacement of the present single-order system by the double-order system it be done only under a reasonable and well-considered rule.

"We suggest that an early conference be held between the commission and representatives of the interurban railroad companies to formulate a proper rule so that the same may be made effective by Jan. 1.

"4. Your recommendation that obstructions to sight at curves where sight is badly obstructed be removed, and that until this be done slow-speed signals should be posted at such curves limiting the rate of speed to not more than 15 m.p.h., this company will comply with. We suggest, however, that the better practice would be to so limit the speed at such points as to permit the car to be stopped within half the range of vision of the motorman.

"In this connection we call attention to the fact that this company's policy has been, and still is, where possible, to remove such obstructions and that this has been done in many instances.

"5. Your recommendation that division superintendents and trainmasters—by which we understand is meant those in immediate charge of trainmen—should not be burdened with other duties than those pertaining to train operation, which we understand to be those usually devolving upon the transportation department, this company will gladly conform to, in accord with its present practice. The commission will observe that the organization required by the mileage of this company's lines has hitherto compelled the adoption of the principle referred to, but that in the case of many small lines operating only a few cars, where the superintendent must necessarily have charge of rolling stock, roadbed and overhead construction, as well as all other property of the company, such a rule cannot be followed.

"6. Your recommendation that this company shall carefully consider and report to the commission the expediency of establishing a committee on safety this company will gladly comply with."

Hugh McCloskey, president of the New Orleans Railway & Light Company, is taking a very active interest in endeavoring to secure the selection of New Orleans for the World's Panama Exposition. This question is to be brought up before Congress at the present session.

STREET RAILWAY RIOT IN TORONTO

A riot of considerable proportions directed against the local railway company occurred in Toronto, Dec. 7, following a mass meeting called by the Mayor and City Council to protest against some new prepayment cars put into service by the Toronto Railway Company and the enforcement of "no smoking" rules on the cars. A mob composed of people who had been at the meeting listening to the inflammatory speeches there, reinforced by others in the streets, threw stones and other missiles at every car that operated on Yonge Street for over an hour. Two constables, one conductor and five citizens were injured and a number of cars damaged by broken windows before the police could stop the riot.

The trouble seems to have been due partly to the hostile attitude of the Mayor and other local authorities toward the railway company, partly to politics because of the approaching election, partly to the delays in boarding cars because of short platforms, and partly to the cold weather, which made any delays in boarding disagreeable to passengers.

The Toronto Railway Company has had under consideration for a good many months the installation of prepayment cars on its system. On Nov. 26 the company announced through the press that the system would be first started on the Yonge Street line, the most important street in the city. Fifteen cars were equipped with fare boxes and put in service. On Nov. 29 the company announced that on Dec. 1 all the cars would be operated on the prepayment system and where they were not equipped with fare boxes the conductors would collect fares with the present type of fare box. Simultaneously the company announced that passengers would not be allowed to stand or smoke on the rear platform, but would be obliged to step inside the car.

The new rules involved such a great change in the habits of the people that it led to many delays, and a public meeting to protest against the change was called for Dec. 7, with Mayor Geary in the chair. The Mayor's speech was particularly strong against the company. According to the reports in the press he said in part: "If we were not thoroughly law-abiding, I may say docile, there would have been breaches of the peace already. The great danger is that an exasperated people may be disposed toward breaches of the peace which all of us would rather not see committed."

The Comptroller of the city is reported as saying: "Toronto will never have a proper kind of car service until it owns and operates a car service for itself. We are going to ask the Legislature to change the law which gives such power to a private company."

Other speakers urged that the city should operate the railway as a municipal enterprise upon the expiration of its franchise. Following this meeting the riot already described occurred.

At a hearing held Dec. 9 by the Ontario Railway and Municipal Board to consider the subject it was decided that the front doors of the trailers should be open to allow the exit of passengers. The company also announced that it had decided to allow conductors to exercise their own judgment about allowing passengers to use the rear doors of the cars for exit when the cars were crowded.

Corporation Counsel Drayton asked that the system should be suspended during the Christmas shopping season, but the request was not granted. A number of witnesses testified in regard to the difficulties in boarding cars and the discomfort caused by the inclement weather. The counsel for the railway company claimed that a large part of the difficulty had arisen because the question had been used at the City Hall as a matter of politics, while at the office of the company it was treated as a matter of business. He believed that if a fair trial were given the system would prove advantageous to the public.

As a result of the hearing the board declined to revoke its permission allowing the company to use the cars, but adjourned the hearing until Dec. 19 to give the company time to collect

statistics showing the adaptability of the new system to Toronto conditions.

Thomas W. Casey, general manager of the Pay-as-You-Enter-Car-Corporation, New York, on being interviewed, said that while the Toronto cars had been licensed by his Canadian company, he attributed the trouble largely to the fact that the platforms were not designed according to the specifications of his company and that they were shorter than experience had shown to be desirable. It was Mr. Casey's opinion that if the cars had been designed with longer platforms the trouble would have been avoided.

NATIONAL CIVIC FEDERATION COMMITTEE DISCUSSES STRIKE PREVENTION

On Tuesday, Dec. 13, a meeting of a sub-committee of the National Civic Federation was held in New York to discuss means of preventing strikes by the employees of public service corporations. The chairman of the committee, Seth Low, ex-Mayor of New York and president of the federation, discussed the Erdman act, which provides for arbitration of labor troubles on interstate railroads. Under this act the chairman of the Interstate Commerce Commission, or the Commissioner of Labor, can offer his services whenever a controversy arises between a railroad and its employees. The Canadian arbitration act has a coercive provision that no strike or lock-out shall take place without 30 days' notice. Mr. Low said that both acts had proved very successful. Continuing, he said that strikes of employees of public service corporations were especially undesirable because of the injury to the public. He then read a draft of a proposed arbitration act which could be submitted to the annual conference of the federation after amendment by the sub-committee. If approved by the main body, this proposal could in turn be offered to the Legislature of the State of New York for passage as a law.

The principal feature of Mr. Low's suggestion was that before striking employees of public service corporations must file in writing a statement of grievances both with their employers and with the State Board of Mediation and Arbitration, and that in like manner corporations must give proper notice of a lock-out; that immediately on receipt of such statements the board should offer its good offices; that the Governor of the State could appoint an investigating committee of three, on petition of one of the parties in dispute or of any five citizens of the State, or on his own initiative. The arbitration committee might be composed of members of the regular board or of men especially familiar with the matter in dispute.

William C. Rogers, a member of the State Board of Arbitration, explained that the present arbitration law covered practically all the points brought up by Mr. Low, with the exception of the written advance notice of grievances. Several labor leaders present said that they would not encourage for a moment the passage of any law which tied the hands of the workmen as to when and how they should have the right to strike. They had no objection to arbitration, but it was their experience that it was much harder to get the employers to submit to arbitration than the workmen.

After further discussion it was decided to examine more closely the present arbitration law of New York State with a view of incorporating in the same some amendment along the lines suggested by Mr. Low. This subject will be discussed at another meeting of the sub-committee before the annual conference of the National Civic Federation to be held Jan. 12 to 14 inclusive in New York. It is likely that the parent body will be asked to appoint a committee to study the possibility of unifying arbitration laws throughout the country.

During August, 1910, 14 persons were killed and 414 persons were injured on the electric railways in Pennsylvania. In August, 1909, the killed numbered 19 and 577 were injured

HEARING ON SERVICE IN SUBWAY IN NEW YORK

The hearing on service in the subway in New York was continued before Commissioner Eustis, of the Public Service Commission of the First District of New York, on Dec. 7, 1910. Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, said that records were kept of the ticket sales at the subway stations, but that the tickets deposited in the chopping boxes were not counted regularly. Mr. Hedley repeated the statement which he made at the hearing on Nov. 30, 1910, that the increase in passengers on the Broadway line between the Dyckman Street station and 137th Street, both included, for July, August and September, 1910, was less than 0.1 per cent over the corresponding period in 1909.

E. G. Connette, transportation engineer of the commission, submitted a tabulation of the inspection which was made under his supervision of the north and south bound service on the Broadway division on Nov. 15, 1910, showing the number of trains, cars, seats and passengers, southbound, past the Dyckman, 157th Street and 137th Street stations, from 6:30 a. m. to 9:30 a. m. and northbound past the same stations from 4:30 p. m. to 7:30 p. m. This statement showed that some southbound trains were overloaded south of the 157th Street station and the 137th Street station. It also showed some trains overloaded northbound at 137th Street station and at 157th Street station. He also submitted a blueprint showing a comparison of the traffic from inspections made on March 23, Sept. 19 and Nov. 15, 1910. Mr. Connette also said that there had been an increase in patronage of 23 per cent north of 137th Street on the five local trains that are run to Dyckman Street during the evening rush hours. He then explained his records in detail. Delays in train movement at 103d Street and between 103d Street and Ninety-sixth Street southbound were caused by the necessity of fitting the southbound express trains on the Broadway branch into a predetermined schedule in order to balance the traffic south of Ninety-sixth Street. The only way this could be eliminated would be to run all of the express trains to Ninety-sixth Street local in order to maintain an even headway and to fit them into the schedule in their proper places when they reach Ninety-sixth Street. It would, perhaps, tend to improve conditions to provide 15-minute periods or 20-minute periods instead of 30-minute periods during the non-rush hours in which the company should be required to furnish seats at least equal to the number of passengers.

The details of the service furnished on Sunday, Nov. 27, were then discussed. On this date there were 25 half hours in which the order of the commission had been violated. Mr. Hedley could not at the time recall the special circumstance that was responsible for the conditions on the day mentioned.

Commissioner Eustis said that he would recommend that this violation of the order of the commission go to counsel for prosecution, but told James L. Quackenbush, of counsel for the company, that he would give the company an opportunity to study the traffic returns of Nov. 27. The hearing was adjourned until Dec. 13, 1910.

Subsequently Mr. Hedley addressed a letter to the commission in which he explained that the violations of the order of the commission between noon and midnight on Nov. 27 were due to accidents to the drawbars of two express trains and to an express train which had to be taken out of service because it could not make the schedule. In the letter to the commission Mr. Hedley said:

"It is the intention of this company to obey Order 1211, but there are times when unavoidable failures occur to the equipment of the company or otherwise that prevent the company from actually getting trains over the road to accommodate every person with a seat."

In a second letter to the commission Mr. Hedley said, referring to the count of Nov. 27:

"A check taken on a previous Sunday showed sufficient service during the hours mentioned, and we have added five specials

to the regular Sunday schedule. The matter of sufficient service will receive the proper attention and another check will be taken Sunday, Dec. 11."

The commission has directed its counsel to proceed against the company in the Supreme Court for violation of the order of the commission in regard to service in the subway.

Mr. Hedley issued a statement on Dec. 11, 1910, in which he referred, in part, as follows to the improvements which are being carried out in the subway:

"We have within the last 19 months ordered 325 new steel cars with center side doors, and reconstructed 469 of the old cars, providing them with center side doors, and installed on each car a new system of passing the signal to the motorman by means of a flashlight, so as to save a few seconds at each station for the train. We are installing the most up-to-date brake development, known as the electro-pneumatic brake, which will, when completed, stop a 10-car train running at a speed of 40 m.p.h. on a level track in a distance of 365 ft.

"This is the first train-retarding system anywhere in the world to accomplish these results for heavy train movement. We are improving and changing our signal system so that the greatest possible number of trains and cars may be operated.

"We are lengthening the local platforms so that six cars per train may be operated instead of five and 10 cars on the express tracks instead of eight. Each of these 10-car trains is being equipped with motors equal to 3200 hp, or more than twice the horse-power used on the large steam locomotives on the Pennsylvania system. We are increasing our power house and its appurtenances to furnish power for this increased load. Increasing the length of the station platforms is a hazardous engineering undertaking, necessitating the blasting of rock immediately adjoining the railroad tracks. To accomplish this work with reasonable safety necessitates trains stopping at times before the blasts are shot off, and stopping of trains for the erection of timbers, supports and girders, and the operation of trains past these points under a slow speed.

"The above-related improvements will cost nearly \$10,000,000. They indicate the company's desire to relieve, if possible, the indecent congestion of passengers in the subway during the rush hours."

INVENTORS' GUILD

During the last year an organization of inventors has been incorporated with headquarters in New York City for the following purpose, as outlined in the constitution of the society:

"The object of the guild is to advance the application of the useful arts and sciences, to further the interests and secure full acknowledgment and protection for the rights of inventors, to foster social relations among those who have made notable advances in the application of the useful arts and sciences."

The membership of the Inventors' Guild is limited to 50. A member must be formally proposed by a member of the guild, must be personally known to five members of the guild, must pass the membership committee and board of governors, and finally must be voted upon by the whole membership, four per cent of the votes cast being sufficient to reject a candidate. The object of such discrimination is to include among the members of the guild men who not only have made inventions, but who have achieved some measure of success in connection therewith, and who will therefore be capable of exerting some influence; and also that no one shall be admitted who will not be congenial to practically the entire membership.

The officers of the Inventors' Guild are as follows: Ralph D. Mershon, president; Chas. W. Hunt, first vice-president; Chas. S. Bradley, second vice-president; Thomas Robins, secretary, and Henry L. Doherty, treasurer. At present the guild has 29 members, including the following: Bion J. Arnold, Dr. L. H. Baekeland, Thomas A. Edison, Stephen D. Field, James Gayley, Peter Cooper Hewitt, Prof. Michael I. Pupin, Dr. F. Schniewind, C. H. Smoot, Prof. Carl Thomas and B. F. Wood.

COMMUNICATION

THE ADVANTAGES OF STORAGE BATTERY CARS

Boston, Dec. 12, 1910.

TO THE EDITORS:

I read with much interest your comment in the *ELECTRIC RAILWAY JOURNAL* of Dec. 10 on the design and advantages and disadvantages of the storage battery car as we have it today. It has occurred to me that its greatest advantage has been overlooked by you, in that by its use the load factor of any existing plant will be greatly increased.

Its use, as you say, will be confined to lines where the traffic is light or irregular. In any street railway system the charging of such cars can take place when the load on the plant is low. The installation of such cars will also reduce the peak load of many plants, giving a greater operating economy.

WARREN B. HOPKINS.

FINAL DECISION IN THIRD AVENUE REORGANIZATION

After a rehearing, an opinion has been issued by the New York Public Service Commission for the First District denying the request for a change in the order disapproving the plan for reorganization of the Third Avenue Railroad System. An abstract of the order in which the commission disapproved the plan was published in the issue of the *ELECTRIC RAILWAY JOURNAL* of Aug. 13, 1910, page 262.

In its latest opinion, dated Dec. 5, 1910, the commission says: "The commission has carefully considered the grounds specified in the application for rehearing as reasons for a change in its order as well as the additional proof presented. Some of these specifications of error indicate that in the opinion of the applicants the commission has in its conclusions erred as to the law either in the interpretation of the statutes of the State or in the application of those statutes to the application of the petitioners, and in some cases it is stated that constitutional rights of the petitioners have been infringed. Many of these specifications of error indicate that in the opinion of the applicants the commission has in its conclusions erred as to the effect, the weight or the existence of evidence. In other instances the position of the commission is not fully or correctly stated.

"In view of the very extended discussion in the former opinion of the commission, it does not seem necessary to refer to these specifications in detail or to say more than that after careful examination the commission sees no reason for changing upon such grounds its determination."

In referring to the value of the property to be acquired by the new company and for which securities proposed to be issued are the important subject of investigation, the commission mentions a specification of errors in figures. It says, however, that "if these claims were to be granted, the decision of the commission now sought to be abrogated would not be affected; for property worth not more than \$35,000,000 or \$40,000,000, against which there are nearly \$18,000,000 of liabilities, leaving net, say, \$17,000,000 to \$20,000,000 of property, does not justify the issuance of \$55,000,000 of securities, even though \$8,000,000 to \$10,000,000 of these securities be used for improvements and other necessary expenses.

"The additional proof as to receipts and expenditures for the year ending June 30, 1910, and as to an increase of receipts in July and August, 1910, over the same months in 1909 does not in any substantial way contradict the conclusions stated in the opinion of the commission; it confirms them.

"The commission, not having before it complete figures for the entire year of 1909-1910, estimated from partial figures that the income applicable to the investment would be about \$1,900,000 to \$1,945,000. The figures for that year now introduced at the rehearing show a surplus of \$2,432,348, which is increased to \$2,532,348 by arbitrarily deducting from the operating expenses of the Yonkers Railroad as officially reported the sum of \$100,000 expended in rehabilitating certain stretches of track. While such expenditure to repair past neglect was abnormal, it may also be said that the very low cost of maintaining the new

cars in use on other roads of the system makes their operating expenses at present abnormal in the opposite direction. Taking the figures as stated without the adjustment suggested, there is a surplus of..... \$2,432,348 from which take the following items:

Compensation of receiver for conduct of the properties, July 1 to Dec. 31, 1909.....	\$37,500	
Depreciation, as in previous opinion.....	500,000	
Other reserves, same	30,000	567,500
Final net		\$1,864,848

"With the \$100,000 item deducted from operating expenses, the gross income applicable to the properties would be \$1,964,848.

"The operating ratio from the figures shown at the rehearing was 60.5, which is, as the commission anticipated, unusually low, the net results being practically the amount estimated by the commission.

"As to the annual increase in receipts, the evidence now introduced tends to show, disregarding first the collateral items of income from different sources which do not vary much from year to year, that the receipts from passengers were (1910) \$7,504,646, as against (1909) \$6,844,144, an increase of \$660,502, or about 9.6 per cent, and that the car miles operated in 1910 were less than in the year 1909 upon the Third Avenue, the Dry Dock, the Forty-second Street and the Union, which were the main lines of the company, and were greater only on the Southern Boulevard, the Westchester and the Yonkers, where the percentage of increase in receipts was the greatest. In view of the fact that new and larger cars and the pay-as-you-enter system of collecting fares would in any case be expected largely to increase the returns after July 1, 1909, when they were introduced, and would of itself cause an increase until the fall of 1910, it does not seem that the 9 per cent increase furnishes any ground for assuming that the 5 per cent annual increase estimated by the commission from past experience, where circumstances were from year to year substantially the same, is not enough. The comparison of July and August, 1909, with July and August, 1910, as introduced at the rehearing shows an increase of 11.8 per cent in July and of 5.3 per cent in August."

The commission reaffirms the position regarding capitalization stated in the earlier decision, as follows: "The commission believes that the amount of capital represented by bonds should not be in excess of the amount upon which there is definite certainty that interest may be earned. It would obviously be unwise and useless to approve a plan which might easily mean another foreclosure and reorganization in a few years. This is the second time within 10 years that the Third Avenue company has been in the hands of a receiver. It is time that a conservative plan were adopted and upon such sound principles that another cataclysm will not be necessary. The commission believes this policy to be sound."

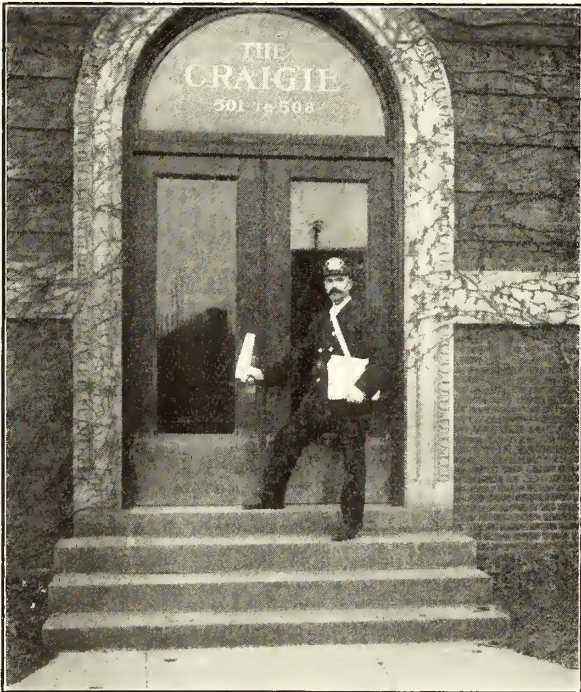
"It should also be noted that the commission has not fixed upon any specific amount as to the final sum of stocks and bonds that may be issued. The single question to be decided was, and is, whether the application should be granted. However, in order to facilitate an early reorganization upon a secure and sound basis, the commission in its original opinion indicated the factors it thought should be considered, reserving its determination upon certain factors, such as the proper allowance for discounts, commissions and organization expenses of the new company, until the time when a new plan is submitted. This was proper and necessary, for certain of these expenses were unknown and not fully ascertainable. Others depend upon the kind of securities to be issued, etc. However, as the applicants have not seen fit to modify their plans, but insist upon action upon the application as submitted, the request of the petitioners that the commission abrogate, modify or change its order herein so as to grant the relief asked for in the petition of the bondholders' committee and the petition of the Third Avenue Railroad are denied."

The expectation is that the case will now be taken to the courts.

NOVEL ADVERTISING BY THE BOSTON ELEVATED RAILWAY

As is well known, the Boston Elevated Railway during the fall inserted at intervals in the leading newspapers of the city a series of maps explanatory of the remarkable development of the system in the way of providing rapid transit since the elevated assumed control. With these maps were given some figures which disclosed facts rather startling to the layman whose intimacy with the elevated system as a whole began in the morning with his ride from his home to his office and ended in his safe arrival at the former place in the evening. Several references to this series of advertisements have been published in the *ELECTRIC RAILWAY JOURNAL*, and upon their completion, as announced in this paper, it was decided to have them reprinted and bound together in pamphlet form, with a short introduction. It was then a question of the manner in which this issue of 100,000 pamphlets should be distributed, and the thought occurred to Maj.-Gen. W. A. Bancroft, president of the company, that a novel way to accomplish this was to have them distributed from house to house by neatly uniformed employees.

The entire territory served by the company was divided into



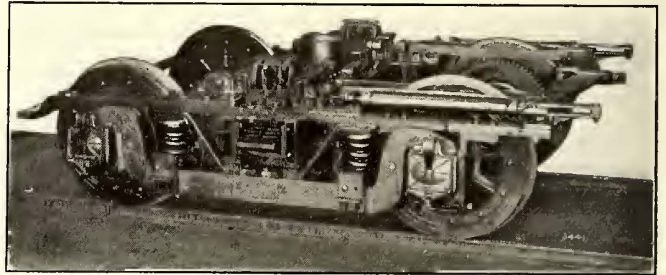
Employee of Boston Elevated Railway Delivering Traffic Pamphlets

sections and 254 men from the several divisions were assigned to the duty. They reported for work with tidy uniforms and shoes polished, and were provided with white gloves and a canvas strap in which to carry the pamphlets. Each man was supplied with 150, and he took a car to his particular district and began his route from house to house, ringing the bell and politely presenting the pamphlet, with the compliments of the company, to whomsoever answered the bell. When nobody came to the door, he left a pamphlet securely placed in the mail box. When his first load was delivered he returned for additional pamphlets until his district was completely covered.

The cut herewith shows one of the detail in the act of delivering one of the pamphlets. The entire 100,000 were distributed at an average rate of 46 per hour, and a very favorable impression was made upon the public. It is undoubtedly true that the pamphlets received more attention on account of this personal delivery than if they had been forwarded through the mail, as is the usual custom.

ELECTRIC MOTOR AND TRAILER TRUCKS FOR THE HUDSON COMPANIES

The Baldwin Locomotive Works have recently completed 50 motor and 50 trailer trucks for the Hudson Companies, New York. These trucks were built to the company's specifications for use in tunnel service in and about the City of New York, where the requirements are most exacting. The track gage is



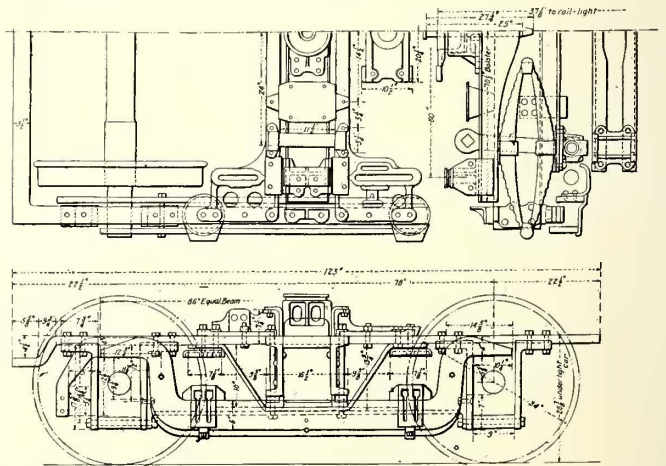
Motor Truck for Hudson Companies

standard and the trucks are all designed for a center-pin load of 30,000 lb.

The motor trucks are designated by the builders as class 78-30-S. They are of the M. C. B. standard type, and are each propelled by two GE-76-B motors, arranged for nose suspension and inside-hung. The actual weight of the truck without motors is 13,150 lb. The wheelbase is 78 in. The truck frame is of forged steel, with the side and end frames in one piece. The transoms consist of 10-in. steel channels and are braced to the side frames by heavy cast-steel gussets. These gussets act as brake lever guides and also carry the chafing plates so that the thrust is transmitted to the bolster near the ends of the latter, thus materially relieving the transoms of strain.

The bolster is built up, the main member consisting of an 8-in. channel which is placed horizontally and reinforced by a pressed-steel truss member. The bolster swing links have cast-steel adjusting blocks at their lower ends so arranged that the bolster can be easily raised to keep the center plate at the proper height as the truck settles.

The center plate is a special feature of this truck. It is of



Side Elevation and Half Plan of Motor Truck for Hudson Companies

cast steel and of ample depth so that, in the event of derailment, it would be practically impossible for the truck and car body to part company. Furthermore, the line of push in the chafing plates is so nearly in the same horizontal plane as the line of resistance in the center plate that there is practically no tendency to twist the bolster and the chafing wear on the truck parts is minimized.

The wheels are $34\frac{1}{4}$ in. in diameter, with 28-in. centers and bolted steel tires. The journals are 5 in. x 9 in. The wheels, gears and axles were finished and mounted by the Standard

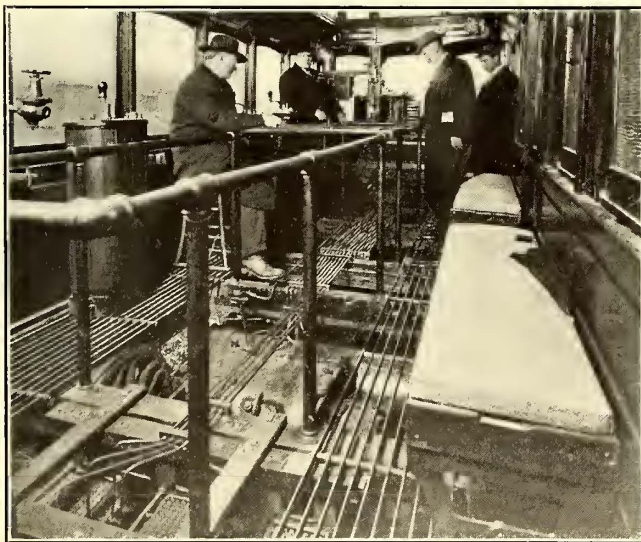
Steel Works Company. The same company also manufactured the equalizing beam springs and the bolster springs. The brake is of the inside-hung type. It is arranged with a transverse radial beam placed over the end of the truck frame and connected to the live levers by horizontal links. The brake release springs are incased in pieces of 2½-in. wrought-iron pipe.

The trailer trucks are generally similar to the motor, as far as design is concerned. The wheelbase is 66 in. and the frames are lighter in section. The wheels are of solid rolled steel, 30 in. in diameter, with ¼-in. x 8-in. journals. The truck complete weighs 9110 lb. It is designated by the builders as class 66-30-T.

These trucks have been designed to meet specific operating conditions. The fact that the M. C. B. type has been selected for this severe work is most significant. For heavy service, where stops are frequent and acceleration rapid, the builders believe this type of truck to be unequalled.

DETROIT INSTRUCTION CAR

The Detroit United Railway has been operating since last April an instruction car in which all of the motor and braking apparatus can be plainly seen through the gratings of the floor. This car is operated over a stretch of 100 ft. in the Jefferson Avenue car house. The students are not taken on for instruction in apparatus until they have spent 6 to 15



View Showing Open Floor of Detroit Instruction Car

days under the eye of a motorman instructor on regular passenger cars. Besides the apparatus under the floor the car is furnished with every type of controller, fuse, air gage and other car equipment used on the Detroit system. The instructor explains the function of every part from the collection of the current to the disposition of the return, and also illustrates special cases, such as electric emergency braking. The student is passed along for service as soon as he has proved that he understands the motive equipment as thoroughly as his work requires.

TRAFFIC IN SYRACUSE

At the close of a hearing held in Syracuse, N. Y., on Dec. 9, 1910, to consider the application of the Syracuse Rapid Transit Railway to the Public Service Commission of the Second District of New York for permission to construct a double-track extension in Willow Street from Lodi to Townsend Street, Commissioner Decker announced that C. R. Barnes, electric railroad inspector of the commission, would be instructed to study traffic questions in Syracuse and report to the commission.

THE "TURN-IN" CAR

John F. Ohmer, president and general manager of the Ohmer Fare Register Company, Dayton, Ohio, has patented a new platform prepayment method called the "turn-in" car. The essential feature of this invention is the use of a foot-controlled registering turnstile in combination with any type of fare box. The following descriptions and accompanying plan drawings will show the adaptability of this method for efficient fare collection both on short and long platform cars.

Fig. 1 is the part plan of a car with a 4-ft. platform, 24-in. platform steps and a single body end door which

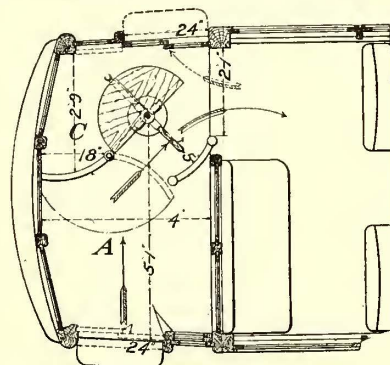


Fig. 1—"Turn-in" Principle Applied to Short Platform

gives a clear passage of 2 ft. 1 in. The ingress area is denoted by *A* and the conductor's position in the vestibule corner opposite the entrance by *C*. On cars of this kind it is more desirable, of course, to have the exit at the forward end of the car, but an ingenious arrangement of the turnstile permits the rear passage to be used for exit in the direction indicated by the arrow. This is accomplished by dropping the turnstile arm nearest the exit while simultaneously therewith the turnstile is locked against operation until the arm is returned to its normal position by the conductor. The "turn-in" mechanism requires very little space and its use calls for no change in the car construction. A convenient feature which can be applied in combination with the turnstile is a small relief table on which the conductor temporarily can place his punch, transfer pad, etc. A drawer can be built under the table top if desired.

Fig. 2 shows a typical application of the "turn-in" system to a car with a platform 6 ft. 7½ in. long. On this plan *A* is the ingress space, *B* the platform space for paid passengers and *C* the conductor's space. In addition to handling the turnstile equipment and accessories as used on the short platform the

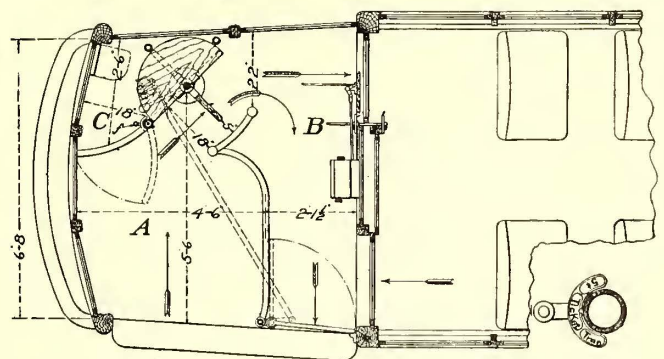


Fig. 2—"Turn-in" Principle Applied to Long Platform

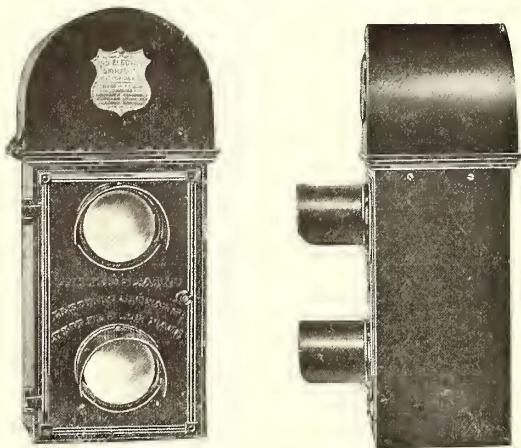
conductor controls the exit gate or door by means of an under-platform lever. Several shafts and levers are connected with the turnstile to operate the fare register, which is mounted on the vestibule side of the end bulkhead. Fig. 2 also shows a detail of the fare-setting device, which is placed at the point *J* near the turnstile.

An American consular officer in Japan reports that a local city council and city assembly, composed of Japanese, are planning an 18½-mile electric railway to cost, it is estimated, \$4,500,000. Further information can be obtained by addressing No. 5685, Bureau of Manufactures, Washington, D. C.

NEW SPACING SIGNAL INSTALLED IN BOSTON

The Boston Elevated Railway Company has recently installed on several of its surface lines a new type of rear-end or spacing signal which is specially adapted to the requirements of double-track service in districts handicapped by severe grades and sharp curves. The signal has been applied to localities where the company has in the past had difficulty in securing suitable spacing of cars, notably on its double-track line in Blue Hill Avenue, Dorchester, and in the Fellsway territory. The operating rules of the company provide for the exercise of due care in the movement of cars down grades or through curves, but as an extra precaution the type of signal described below has been placed in service.

The new rear-end signals were designed and built by the



Front and Side Views of Spacing Signal Box

United States Electric Signal Company, of West Newton, Mass., according to the requirements of the electrical engineering department of the railway company, five blocks having been installed on Blue Hill Avenue and four blocks on the Fellsway. The signals are operated by direct current taken from the overhead trolley wire of the surface system, and as placed in service are of the illuminated type, without semaphore attachments, although the latter can easily be provided at any time. The wiring arrangements of a single block are shown in the accompanying diagram. In general the signal is designed to avoid the necessity of ever passing a red lamp, procedure being only upon the reception of indications by green signal lights. At the entrance of each block two weatherproof metal signal cases are installed, each containing a pair of lamps, the colors being red and green in each box. Under normal conditions an approaching car finds a green light displayed in the first of the two signal boxes if the block is free. The second signal box is located on a pole about 100 ft. beyond the first box, while the usual overhead contact switch in the trolley is placed in the line opposite the first box. Under normal conditions the red lamp in the second box is in circuit and visible as the car approaches the entrance of the block.

When the car passes the overhead contact switch at the beginning of the block the circuits of the green lamp in the first box and the red lamp in the second box are broken by a tripping relay which throws the switch in the relay case at the top of the second box upon a second pair of contacts that energize the circuit of the red lamp in the first box and that of the green lamp in the second box. The motorman, upon receiving the indication of the green lamp in the second box, proceeds to pass through the block at normal speed, the overhead contact being designed to permit the passage of cars without slackening. The passage of the trolley into the block throws on the red lamp in the first box, as outlined, and this lamp, together with the green lamp in the second box, remains in circuit as long as the car is in the block. No following car is allowed to pass the red lamp in either box, but as soon as the car which first entered the block passes out the contact of the trolley with an overhead switch permits a restoring current to flow through a clearing relay

in the second box. This throws the contact switch upon the original normal connections, breaks the circuit of the green lamp in the second box and of the red lamp in the first box and at the same time throws the red lamp in the second box and the green in the first back into circuit. In the operation of this signal the motorman of a car which approaches, enters and passes through the block simply passes a green lamp in the first box, observes that the second box on the pole 100 ft. distant gives him a green lamp as the trolley passes the overhead switch and then proceeds without further signal indications. He does not see the red lamp in the first box unless a car is in the block ahead of him, in which case he is not allowed to proceed until receiving the green indication. The green indication must be given by each of the two boxes in succession in order to authorize a car to enter the block. A clear indication cannot be given in the first box until a car has passed out of the block and thrown the green lamp into circuit by making the overhead switch contact at the end of the block.

Each signal box is designed along the lines which the company has employed in its other well-known signals, a Yale lock being provided in each box. The relay contacts are covered with a dome, which is a one-piece casting, to secure protection from the weather. The relay connections are made automatically by spring contacts, and the relay mechanism and local wiring can be easily removed en bloc by taking off four nuts. The contacts are of phosphor bronze and interchangeable. The relay is connected with the signal box by spring contacts located on the under side of a slate base. The springs engage with a set of contact points in the top of the main box, and when the relay is in place are separated from each other by fiber barriers, which reduces the danger from lightning to a minimum. The relay magnets will operate on any line potential over 160 volts. The cores and pole pieces are built of Norway iron and all magnet coils are wound on spools of No. 22 B. & S. covered wire, varnished with three coats of shellac. The signal is provided with a mechanical lock which holds the switch in the relay box against the proper contacts until a release is secured by the passage of a car out of the block. Car-

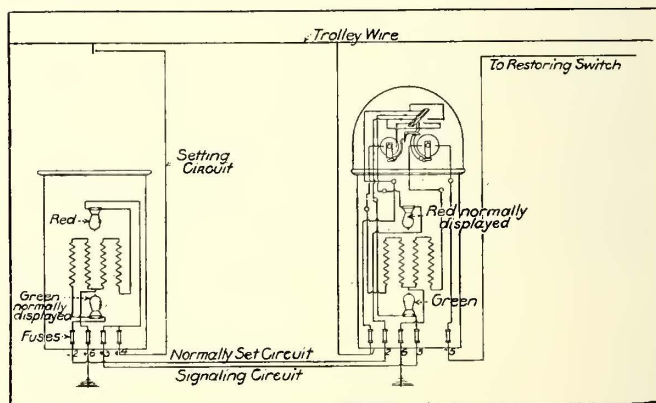


Diagram Showing Circuit of Spacing Signal

center resistance tubes are used in the lamp circuits, and the wiring is No. 14 and No. 16 B. & S. fireproof and white-covered. The fuses are of the Noark type and are separated by porcelain barriers.

HEARING AT CHICAGO ON INTERCHANGE OF TRAFFIC

A hearing was held at Chicago on Dec. 8, 1910, before the Illinois Railroad and Warehouse Commission on the application of the Joliet & Southern Traction Company, Joliet, Ill., to the commission for an order to direct the Wabash Railroad, Rock Island Railroad, Illinois Central Railroad and the Santa Fé Railroad to interchange traffic with it. The attorneys for the steam railroads argued that the commission was not vested with authority to issue such an order as had been applied for by the Joliet & Southern Traction Company. The commission took the matter under advisement.

News of Electric Railways

Elevated Extensions in New York Approved

The Public Service Commission of the First District of New York on Dec. 7, 1910, approved the application of the Interborough Rapid Transit Company for two extensions to its elevated system in the Bronx, but did not take final action on the plan for third-tracking the Second, Third and Ninth Avenue elevated lines. The commission will hold a public hearing on the matter on Dec. 22, 1910, before submitting the plan to the Board of Estimate for final approval.

The plans provide for one line extending up Jerome Avenue to Woodlawn from the present terminal of the Ninth Avenue elevated on the Manhattan side of the Harlem River at 155th Street and an extension of the Third Avenue elevated up White Plains road to the city line. In addition the commission has decided to approve an elevated connection in Fifty-ninth Street between the Second Avenue elevated line and the Queensboro Bridge. The cost of these extensions will be \$32,000,000. The third tracks are to be added, it is understood, under the present 999-year franchise held by the Manhattan Elevated Railway. The two extensions in the Bronx are to be operated on 85-year franchises, divided into terms of 25 years at first and 20 years each for three succeeding renewals, the terms of payment to the city to be subject to readjustment at the expiration of each term. The construction of each of the extensions must begin within six months after the company has obtained the consents and shall be completed in two years after work is begun. Both extensions are to be three-track roads, except that the Jerome Avenue line will be two tracks from the point of divergence to 162d Street, and from there to Woodlawn Cemetery three tracks.

W. R. Willcox, chairman of the Public Service Commission, has issued a statement reviewing the proposal of the Interborough Rapid Transit Company to construct additional rapid transit lines in New York, in which he says:

"The proposal of the Interborough Rapid Transit Company has several attractive features not contained in any offer heretofore made. I refer particularly to the offer to furnish \$75,000,000 of the \$128,000,000 for new construction, to the willingness to reduce the length of lease of the present contracts, to the additional extensions that the company is willing to build and to the agreement to operate additional future extensions.

"Its proposition not only embraces the normal extensions of the present subway, but the company offers to build the major portion of the Triborough route and obligates itself to operate the whole of the Triborough system if the part not included in its offer is constructed by the city. It offers to operate this entire system in conjunction with its present system for a 5-cent fare on all lines from one end of the city to the other. Furthermore, the entire system will belong to the city from the beginning, and the city will have the right to take any of these extensions after 10 years. It would thus be possible in case of improper management to set up a new system.

"The company is willing to furnish \$75,000,000 of the estimated \$128,000,000 necessary to build and equip these lines. It is also willing to put \$31,000,000 into the third-tracking and extension of its elevated system. It also proposes to turn over to the city the Steinway tunnel, which has cost nearly \$8,000,000, provided the city will pay \$1,500,000 to complete it. Thus the company is willing to contribute altogether about \$114,000,000 of its own money toward the development of transit in this city. The ability of the company to prevent proper extensions of rapid transit in this city as a part of the main system would be removed and this difficulty has really been the worst one to deal with in the whole transit situation.

"In view of the fact that the present subway is operated under two leases—one with a term of 50 years and right of renewal for 25 years more, and the other for 35 years, with a renewal of 25 years more, the company agrees to the suggestion of the commission that, if such course is deemed advisable, it will be willing to have the present contracts so modified that the entire period for operation of

the present subway and extensions shall be merged into one period and is willing to accept 49 years from the time of the completion of these extensions with no right of renewal.

"The money to be furnished for construction and equipment by the Interborough Rapid Transit Company is to take precedence over the bonds issued by the city for the construction of those extensions, but after the payment of operating expenses and the interest and sinking fund on both classes of bonds, the net profits for five years are to be paid to the city and for the balance of the time all surplus earnings over these fixed charges are to be divided equally between the city and the company. The terms for operating the Fourth Avenue subway, it will be observed, are such that any deficit over the running expense is to be borne by the city, but inasmuch as all net earnings over fixed charges on the main extensions proposed to be built are to be paid by the city it can readily be seen that such income would doubtless much more than offset any possible deficit in the operation of the Fourth Avenue subway. The number of miles of the proposed extension will be 35.5 of road and 106.12 miles of track. The present subway consists of 25.63 miles of road and 72.83 miles of track."

William G. McAdoo, president of the Hudson & Manhattan Railroad, conferred with the members of the Public Service Commission on Dec. 9, 1910, and it was understood the subjects discussed related to terms of a supplementary offer which he is understood to be preparing for the operation of proposed new subways.

The Board of Estimate has approved the route for the Steinway tunnel of the Interborough Rapid Transit Company under the East River to Long Island City. The plans will be sent back to the Public Service Commission and consents obtained from property owners for extending the tunnel to the Grand Central Station. The work will then be done by contract and the commission will advertise for bidders to operate the line.

A two-hour conference was held on Dec. 13, 1910, between Mr. McAdoo and the members of the Public Service Commission, and on Dec. 14, 1910, Mr. Willcox, chairman of the commission, called on Mayor Gaynor. As previously stated in the *ELECTRIC RAILWAY JOURNAL*, Mr. McAdoo has said that his offer could not remain open after Dec. 15, 1910, but it is expected that he will supplement his original proposal with new terms.

The Chamber of Commerce, at its meeting on Dec. 1, 1910, adopted Mayor Gaynor's recent suggestion and agreed to co-operate, through its president, with the president of the Merchants' Association in appointing a citizens' committee to consider the various subway proposals and to report their conclusions to the Mayor. Subsequently A. Barton Hepburn, president of the Chamber of Commerce, and Henry R. Towne, president of the Merchants' Association, announced the citizens' committee to represent those bodies in the subway conference which Mayor Gaynor suggested in recent letters. The committee includes many men of prominence in the financial and business world. It is headed temporarily by ex-Mayor Seth Low.

Cleveland Traction Situation

G. M. Dahl, street railway commissioner of Cleveland, Ohio, spent several days in New York during the week ended Dec. 10, 1910, investigating the statement made by the officers of the Cleveland Railway after the meeting of the board of directors on Dec. 5, 1910, that new securities could not be placed by the company on account of the terms of the franchise under which the company operated.

Councilmen Henry and Pelcinski have threatened to bring the matter to a referendum vote should any change affecting the maximum rate of fare be made in the franchise. On the other hand, Councilman Gahn has suggested that the Cleveland Chamber of Commerce and other public bodies should be invited to select committees to work with the council committee in formulating plans to sell the company's bonds to secure funds for additional cars and power.

F. H. Goff, president of the Cleveland Trust Company, and representative of the Cleveland Electric Railway in the negotiations with former Mayor Johnson, has reiterated the statements which he has often made, that the maximum rate of fare should be higher in order to attract investment. The fare should be raised, and the most strenuous efforts will fail to secure money cheaply as long as the maximum fare remains as low as it is now. It is more important to the public than to the company that money be secured, according to Mr. Goff. Conditions of operation are too uncertain for capital to be attracted under the present rate of fare. The higher rate of fare may never have to be resorted to in order to meet expenses, but the higher the maximum rate is placed the cheaper capital can be secured for the needs of the company. Mr. Goff feels that with a higher maximum fare the bonds of the company could be sold on a 5 per cent basis at par.

In an interview in New York Mr. Dahl was quoted as saying that the company's bonds to an amount necessary to take care of present necessities at least could be sold with an interest rate of, perhaps, 5 per cent, but not at par. He also intimated that the future needs could be taken care of in the same way. Mr. Dahl stated that the financiers were not well informed about the results attained under the new franchise in Cleveland. He further stated that he was opposed to an increase in the maximum rate of fare while there was a possibility of securing the necessary finances.

Former Mayor Johnson, it is understood, believes that the sale of bonds at less than par would make necessary an increase of fare, even without any intentional manipulation to that end.

City Solicitor Baker on Dec. 9, 1910, stated that an amendment to the Taylor franchise affecting the fares to be charged under the grant need not be submitted to a referendum vote, although there would be no legal objection to having the voters approve the amendment.

On his return to Cleveland on Dec. 11, 1910, Mr. Dahl confirmed the statements attributed to him in the interviews in New York. He adheres to the belief that 5 per cent bonds sufficient to take care of the finances of the company can be sold in New York at a slight discount, and intimated that negotiations are under way for the sale of the bonds, on condition that the company consent to that plan of financing its needs. The information secured by Mr. Dahl will be used in connection with the investigation by the street railway committee of the City Council, which was authorized on Dec. 5, 1910.

J. J. Stanley, president of the Cleveland Railway, would make no statement other than that Mr. Dahl's ideas would be submitted to the directors' meeting on Dec. 17, 1910.

Mr. Dahl and Mayor Baehr spent the afternoon of Dec. 11, 1910, in considering the information secured by Mr. Dahl in New York.

National Fire Protection Association

The National Board of Fire Underwriters has recently put forward a plan of unification and consolidation in respect to its fire prevention engineering activities that will be of considerable interest to the underwriting and engineering fraternities alike. It has requested the National Fire Protection Association to take over the work of the two bodies heretofore unaffiliated, the Underwriters' National Electric Association and the Committee of Consulting Engineers of the National Board. The National Board officials have long felt the desirability of unifying the sources from which that body has for so many years drawn its various codes and standards. The National Fire Protection Association has furnished standards for all protective devices and systems; the Consulting Engineers have handled the hazards of gases and oils and the Underwriters' National Electric Association has been responsible for the National Electrical Code. These three standard-making bodies are now to be merged into one—the National Fire Protection Association—and the work of the two latter bodies, which will cease to exist as detached organizations, will be conducted by special committees of the National Fire Protection Association. The Underwriters' National Electric Association will be entitled the Electrical Committee, and the Consulting Engineers will be called the Committee on Explosives

and Combustibles of the National Fire Protection Association. The personnel of the new committees will be identical with that of the two former separate bodies, with the addition to each of one or two desirable members.

The headquarters of the association are at 87 Milk Street, Boston, and the new electrical committee is made up of 20 members, one representing each of the following 19 organizations: Boston Board of Fire Underwriters, New England Insurance Exchange, The Union, Electrical Inspection Department of the National Board of Fire Underwriters, National Association of Electrical Inspectors, Philadelphia Fire Insurance Association, New York Board of Fire Underwriters, Underwriters' Association of the Middle Department, Factory Mutual Insurance Companies, National Board of Fire Underwriters, Underwriters' Association of New York State, Underwriters' Laboratories, South Eastern Underwriters' Association, Louisiana Fire Prevention Bureau, Western Association of Electrical Inspectors, American Institute of Electrical Engineers, American Electric Railway Association, National Electrical Contractors' Association, National Electric Light Association. The twentieth member is Ralph Sweetland, of the New England Insurance Exchange, the secretary.

President's Reference to Public Utilities in Washington

In his message to Congress on Dec. 6, 1910, President Taft made the following reference to the public utilities of Washington in discussing the government of the District of Columbia:

"There are a sufficient number of corporations enjoying the use of public utilities in the District of Columbia to justify and require the enactment of a law providing for their supervision and regulation in the public interest consistent with the vested rights secured to them by their charters. A part of these corporations, to wit, the street railways, have been put under the control of the Interstate Commerce Commission, but that commission recommends that the power be taken from it and intimated broadly that its other and more important duties make it impossible for it to give the requisite supervision. It seems to me wise to place this general power of supervision and regulation in the District Commissioners. It is said that their present duties are now absorbing and would prevent the proper discharge by them of these new functions, but their present jurisdiction brings them so closely and frequently in contact with these corporations and makes them know in such detail how the corporations are discharging their duties under the law and how they are serving the public interest that the commissioners are peculiarly fitted to do this work, and I hope that Congress will impose it upon them by intrusting them with powers in respect to such corporations similar to those of the Public Utilities Commission of New York City or similar boards in Massachusetts."

Railway Affairs in Detroit.—F. W. Brooks, general manager of the Detroit (Mich.) United Railway, announced that through service to Alter Road or the city limits would be established on Jefferson Avenue, on Dec. 12, 1910. From 5:15 a. m. to 5:45 p. m. all Jefferson Avenue cars will run through from the City Hall to the city limits, and from 5:45 a. m. to 6 p. m. there will be a 2-minute service. The rate of fare will not be changed, and the single fare to the city limits will not be put into effect. Workingmen's tickets will be accepted, as in the past.

Inquiry Into Finances of Pittsburgh Railways.—William A. Magee, Mayor of Pittsburgh, Pa., in behalf of the city, has filed a petition with the Secretary of Internal Affairs of Pennsylvania asking that the Pittsburgh Railways and the different corporations whose properties are maintained and operated by it report to the secretary concerning the issues of stocks and bonds made by them at different times and that the secretary call upon those having knowledge of these matters to appear before him and testify, if he shall find this proceeding necessary. The Mayor in his petition alleges that the Pittsburgh Railways is unable properly to maintain its property on account of unreasonable guarantees to its underlying companies.

Chicago Railways Accepts Consolidation Ordinance.—The Chicago (Ill.) Railways has accepted the ordinance which

was passed by the City Council of Chicago on Oct. 11, 1910, granting it permission to absorb the Chicago Consolidated Traction Company and extend its franchise over the lines of that company. The ordinance allowed the company 60 days in which to accept the grant and four months in which to acquire title to the property of the Chicago Consolidated Traction Company. The Chicago Railways has arranged to operate 215 pre-payment cars on the lines of the Chicago Consolidated Traction Company as required in the ordinance. The property of the Chicago Consolidated Traction Company, which was sold recently under foreclosure to Andrew Cooke, chairman of the reorganization committee, will be transferred by him under agreement to the Chicago Railways.

Strike Breaker Acquitted in Columbus.—Gerald O'Leary, alias George W. Brady, who was employed by the Columbus Railway & Light Company, Columbus, Ohio, during the recent strike of the employees of the company, was acquitted of the charge of shooting Helen Kelley in Judge Bigger's court at Columbus on Dec. 7, 1910, after the jury had deliberated nine hours. O'Leary is also under indictment for shooting Mrs. Katherine Kelley and Mrs. Charles Hart, but as the evidence in these cases would be about the same as in the case just completed the indictments will probably be quashed. Brady alleged that the shooting was done by mutinous policemen who fired at him from behind a billboard. In his address to the jury Attorney Clarence Addison for Brady said that at times during the strike Brady stood alone between law enforcement and lawlessness and anarchy. He criticised Mayor Marshall and the administration for the manner in which the riots were handled. Attorney J. P. Dawley, Cleveland, dwelt longest on the theory of reasonable doubt and praised E. K. Stewart, general manager of the Columbus Railway & Light Company, for the firm stand for law and order which he took during the strike.

Meeting of National Civic Federation.—The eleventh annual meeting of the National Civic Federation will be held on Jan. 12, 13 and 14, 1911, in New York City. The State councils, organized by the Federation during the past year to promote the unification and co-ordination of State and Federal laws, will hold their first national meeting in conjunction therewith. In addition there will be special meetings of the various departments of the Federation. State and Federal regulation of corporations and questions dealing with the limitations of combinations in restraint of trade will be considered. A feature of this part of the program will be an exposition of the new act which went into effect in Canada, May 1, 1910. This act provides that upon application of six citizens who complain against a corporation a judge may order that a commission of three be named, one member by the complainants, one by the corporation and the third by the two thus selected. The commission is required to make an extended inquiry and publish a report, which must be accepted by the corporation within 10 days upon penalty of a fine of \$1,000 a day. The need for uniformity in State regulation of railroads and other public utilities, the co-ordination of the laws governing the State railroad commissions and the Interstate Commerce law, made evident at the recent hearings on the railroad rate question, and also the regulation of public utilities by commissions will be discussed. In view of the recent strike questions of special interest to the public at this time were to be considered, to wit: How far is the Canadian Conciliation and Arbitration Act applicable to and desirable for the United States? Can the State laws on mediation and arbitration be made effective in handling industrial disturbances in general? Shall special legislation be advocated applying to street railways and other municipal utilities? Shall the Erdman Act, which is so effective in the case of interstate railroads, be extended to telegraph, telephone and express companies? To promote harmony the National Civic Federation is organizing councils in every State in the Union, composed of representative men from the commercial, manufacturing, mercantile, banking, insurance and professional interests. Delegations of the State Councils will attend the annual meeting to determine upon a program and method of work. The meeting of the sub-committee of the federation on relations with employees is referred to on page 1205 of the current issue of the ELECTRIC RAILWAY JOURNAL.

Financial and Corporate

New York Stock and Money Market

Dec. 14, 1910.

The Wall Street stock market is again very dull and trade is restricted to a limited number of specialties, with trading closely confined to the professionals. As has been the case in all the periods of dull trading within the year, the tone of the market is fairly strong and prices are well maintained. There is still considerable trading in Interborough-Metropolitan and prices are a trifle stronger.

The money market is not changed materially, rates remaining very easy. Quotations to-day were: Call, 2½@3½ per cent; 90 days, 4 per cent.

Other Markets

There has been a fair amount of trading in traction shares in the Philadelphia market during the past week, owing to the practical settlement of the refinancing plans. Prices have declined, however, as the plan offered by E. T. Stotesbury was not considered as favorable as had been anticipated.

In the Chicago market there is still some dealing in the certificates of the Chicago Railways, but price changes have not been noteworthy. There has also been some dealing in Kansas City Railway & Light at former prices.

With the exception of a few sales of Massachusetts Electric and Boston Elevated tractions have been dull in the Boston market. Prices have remained about the same and there has been little interest in the trading.

A few shares of United Railways stock were sold in the Baltimore market during the past week. The prevailing price was from 14½ to 15. There were also some sales of the bonds of the same company at former prices.

Quotations of traction and manufacturing securities as compared with last week follow:

	Dec. 6.	Dec. 13.
American Railways Company.....	a43	a43¾
Aurora, Elgin & Chicago Railroad (common).....	a45	a45
Aurora, Elgin & Chicago Railroad (preferred).....	a88	a86
Boston Elevated Railway.....	127½	a127½
Boston Suburban Electric Companies (common).....	a16	a16
Boston Suburban Electric Companies (preferred).....	a72	a72
Boston & Worcester Electric Companies (common).....	a10	a10
Boston & Worcester Electric Companies (preferred).....	a39½	a39
Brooklyn Rapid Transit Company.....	73¾	73¾
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	82¾	82¾
Capital Traction Company, Washington.....	*128	128
Chicago City Railway.....	a180	a180
Chicago & Oak Park Elevated Railroad (common).....	*3¼	*3¼
Chicago & Oak Park Elevated Railroad (preferred).....	*7¼	*7¼
Chicago Railways, ptcptg., ctf. 1.....	490½	a91
Chicago Railways, ptcptg., ctf. 2.....	a23	a23½
Chicago Railways, ptcptg., ctf. 3.....	a11	a10½
Chicago Railways, ptcptg., ctf. 4.....	a6¼	a6½
Cleveland Railway.....	*91½	*91½
Consolidated Traction of New Jersey.....	a73	a72
Consolidated Traction of N. J., 5 per cent bonds.....	a104	a104
Detroit United Railway.....	a53¼	a59¾
General Electric Company.....	a149½	a153
Georgia Railway & Electric Company (common).....	a117½	a118
Georgia Railway & Electric Company (preferred).....	a88	a88
Interborough-Metropolitan Company (common).....	19	19
Interborough-Metropolitan Company (preferred).....	53¾	53¾
Interborough-Metropolitan Company (4½s).....	79½	79¾
Kansas City Railway & Light Company (common).....	21¼	a22½
Kansas City Railway & Light Company (preferred).....	75	73½
Manhattan Railway.....	138	138
Massachusetts Electric Company (common).....	a18	a18½
Massachusetts Electric Companies (preferred).....	a83	a84¼
Metropolitan West Side, Chicago (common).....	*21	20¼
Metropolitan West Side, Chicago (preferred).....	65	68
Metropolitan Street Railway, New York.....	*19½	*19½
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	62	62
Northwestern Elevated Railroad (common).....	*22	a23
Northwestern Elevated Railroad (preferred).....	*60	a60
Philadelphia Company, Pittsburg (common).....	*14¼	a14¾
Philadelphia Company, Pittsburg (preferred).....	a42	a42¾
Philadelphia Rapid Transit Company.....	a18¼	a18¾
Philadelphia Traction Company.....	a83	a83
Public Service Corporation, 5 per cent col. notes.....	*95	a95
Public Service Corporation, ctf. s.....	*101	a101
Seattle Electric Company (common).....	107¼	a108
Seattle Electric Company (preferred).....	a102	102
South Side Elevated Railroad (Chicago).....	a95	a8½
Third Avenue Railroad, New York.....	11¼	9¾
Toledo Railways & Light Company.....	7	a8
Twin City Rapid Transit, Minneapolis (common).....	108½	107½
Union Traction Company, Philadelphia.....	a11	a2¾
United Rys. & Electric Company, Baltimore.....	*14	*14½
United Rys. Inv. Co. (common).....	*14¼	a15
United Rys. Inv. Co. (preferred).....	*5	*5
Washington Ry. & Electric Company (common).....	*33½	a33¾
Washington Ry. & Electric Company (preferred).....	*87½	a87½
West End Street Railway, Boston (common).....	a80½	a80½
West End Street Railway, Boston (preferred).....	*100¼	a103
Westinghouse Elec. & Mfg. Co.....	65½	66
Westinghouse Elec. & Mfg. Company (1st pref.).....	121	*121

a Asked. *Last sale.

Annual Report of the Michigan United Railways

An income statement of the Michigan United Railways of Jackson, Mich., contained in the annual report for the year ended April 30, 1910, shows the following:

	Includes Jackson—		
	May 1, 1907, to May 1, 1908	May 1, 1908, to May 1, 1909	May 1, 1909, to May 1, 1910
Passengers carried.....	12,095,480	17,161,948	19,860,950
Car mileage.....	3,705,246	4,779,441	5,284,215
Gross revenue and income.....	\$781,963	\$1,026,796	\$1,248,889
Operating expenses.....	433,200	568,158	684,216
Net earnings and income.....	348,763	458,638	564,673
Taxes and fixed charges.....	139,919	186,009	193,236
Bond interest, Michigan United Railways.....	80,000	119,882	167,500
Net income.....	128,842	152,747	203,937
Profit and loss adjustments.....		873	74
Dividends.....	60,000	60,000	60,000
Surplus.....	68,842	91,874	143,863

The report also contains the following statement, showing revenues in detail and expenses:

REVENUES		
Year ending April 30.	1909	1910
Revenue from transportation—		
Passenger.....	\$946,570	\$1,153,868
Baggage.....	2,324	5,454
Special car.....	649	2,885
Mail.....	733	718
Express.....	5,300	7,293
Milk.....	7,322	7,888
Freight.....	28,624	36,933
Switching.....		2
Miscellaneous.....	1,466	
	\$992,995	\$1,215,042
Revenue other than transportation—		
Station and car privileges.....	\$3,288	\$3,079
Parcel room receipts.....	308	904
Storage.....		9
Car service.....	18	58
Rent of track and terminals.....	3,371	3,419
Rent of equipment.....		162
Rent of buildings and other property.....	1,848	1,073
Power.....	27	155
Miscellaneous.....	19,274	9,538
	\$1,021,129	\$1,233,439
Other revenues—		
Interest on deposits.....		\$4,637
Interest from securities owned.....		10,718
Other miscellaneous.....	\$5,667	95
	\$1,026,796	\$1,248,889
EXPENDITURES		
Operating expenses—		
Ways and structures.....	\$37,562	\$42,073
Equipment.....	48,357	77,556
Traffic expense.....	10,150	12,928
Conducting transportation—		
Superintendence of transportation.....	12,782	15,947
Power.....	124,053	151,775
Operation of cars.....	262,744	295,405
General expenses.....	43,354	47,924
Undistributed accounts.....	29,156	40,608
Total operating.....	\$568,158	\$684,216
Taxes.....	\$26,584	\$33,736
Fixed charges—		
Interest on J. & B. C. Traction Co. bonds.....	\$60,000	\$60,000
Interest on Michigan Traction Co. bonds.....	35,000	35,000
Interest on Michigan Traction Ex. bonds.....	25,000	25,000
Interest on J. C. T. Co. bonds.....	39,425	39,500
Balance carried to balance sheet.....	127,629	371,437
	\$1,026,796	\$1,248,889

"The company spent in city extensions and various improvements during the year \$495,611. It expended on the Lansing and Jackson line in addition to the cost provided the sum of \$144,676, and it is due to these expenditures that the very large increase in revenue is being made from the various city systems owned by the company.

"The principal expenditure which is contemplated for the current fiscal year will be in the purchase of new cars and equipment from which a reasonably large increase in revenue is to be expected."

The company also contemplates the construction of some new lines and the addition of 30 new city cars and four interurban cars. Mr. Clark concludes his statement as follows:

"In our last annual report the purchase of an additional property was referred to, and the proposed construction of a line which would connect this system therewith. It was deemed advisable, in order that the connecting line of railway might be constructed without increasing the bonded indebtedness of the Michigan United Railways Company, to wait until such satisfactory showing of earnings was made on the properties as would justify their being taken into the system, and that the proposed purchase and construction be financed by interests friendly to the company without this company incurring any liability in connection

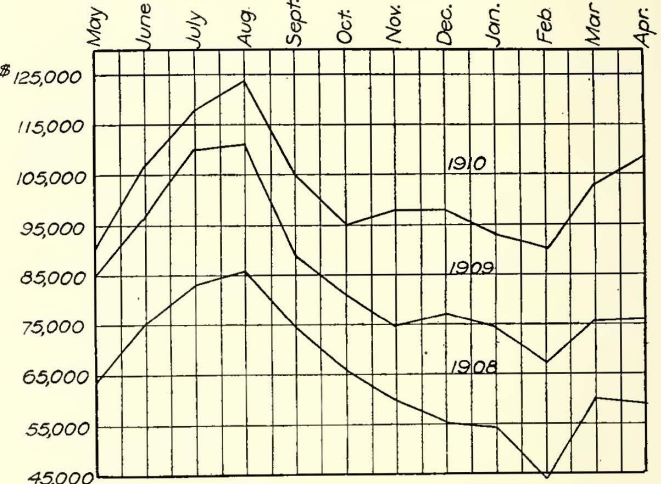


Diagram Showing Gross Revenue and Income of Michigan United Railways by Months

therewith. In accordance with this arrangement the line between Pine Lake and the City of Owosso is now more than half completed and, in connection with the city line in Owosso and Corunna, will become a feeder for your system and later, upon satisfactory terms, may become a part of your company."

The following traffic statistics are contained in the report.

Cash and tickets		Transfers		Passes	
1910	1909	1910	1909	1910	1909
17,018,828	14,579,189	2,596,936	2,337,188	246,086	245,571
Per cent of total:					
85.7	84.9	13.1	13.7	1.2	1.4

The following statistics are based on revenue from transportation only: Earnings per car-mile, 23 cents in 1910 and 20.8 cents in 1909; earnings per car-hour, \$2.39 in 1910 and \$2.108 in 1909; average receipts per passenger, 7.1 cents in 1910 and 6.8 cents in 1909.

Philadelphia Rapid Transit Company Finances

The directors of the Philadelphia Rapid Transit Company and the Union Traction Company on Dec. 7, 1910, approved the plan suggested by E. T. Stotesbury, of Drexel & Company, by which the Philadelphia Rapid Transit Company will surrender its equity in the Market Street elevated line in return for the guarantee by the Union Traction Company of a loan for \$10,000,000. The following official announcement was made after the meetings of the directors of the companies:

"As a result of the numerous conferences ending with the meetings of the two directorates, the board of directors of the Union Traction Company has agreed to recommend

J. Peyton Clark, vice-president, states in the report: "The line of road between Lansing and Jackson was fully completed and operation started on Nov. 5, 1909, so that for six months of the fiscal year ending April 30, 1910, the company had the full benefit of the complete operation of all its lines. It will be of interest to note the increase in earnings from the property during this six months' period, because the statement of the gross earnings and operating expenses with the increase during these months is the only test which can be fairly made of the value of the property and its earning power since the completion of the construction of the Lansing and Jackson line for the reason that until the line was put in operation securities were issued to pay for its cost and were charged against the property without any revenue therefrom."

Mr. Clark then gives the earnings for the six months' period. The increases, as compared with the corresponding months of the previous year, were as follows: November, 29.6 per cent; December, 27.2 per cent; January, 25.3 per cent; February, 34 per cent; March, 34.9 per cent; April, 43 per cent. The report continues:

to its stockholders the guaranteeing of a \$10,000,000 bond issue, provided the stockholders of the Philadelphia Rapid Transit Company will make over to the Union Traction Company the ownership of the Market Street Elevated road, which would then be used as collateral for the new bond issue. The board of directors of the Philadelphia Rapid Transit Company has agreed to recommend this action to its stockholders. These stockholders' meetings can be held only after 60 days' advertised notice, and the plan can become effective only in case City Councils assent. Those meetings have not yet been called, and will not be until the details of the plan are worked out. A letter will be sent to Mr. Stotesbury advising him of this action and taking up with him the other matters referred to in his letter."

Charles O. Kruger, president of the Philadelphia Rapid Transit Company, on Dec. 9, 1910, addressed a letter to Mr. Stotesbury in part as follows:

"With regard to future financing we understand that Thomas E. Mitten has recommended to you that a property of this size should have available each year for new capital requirements from \$1,500,000 to \$2,000,000, and that he has further advised you that, in his opinion, if this property can be financed along these lines for a period of five years it should then be in position to raise any additional capital it may need upon its own credit.

"It is proposed, therefore, to make an issue of \$10,000,000 of bonds running for the life of the city contract and carrying a sinking fund, the principal and interest of which bonds will be guaranteed by the Union Traction Company; the bonds to be secured by a pledge of the equity in the Market Street Elevated Passenger Railway over and above the present \$10,000,000 mortgage upon said property. This equity to-day is represented partly by stock and partly by duebills for actual cash advances for the construction and equipment of the road by the Philadelphia Rapid Transit Company. Additional stock will be issued to take up these duebills, so that the collateral back of this loan will be the entire capital stock of the Market Street Elevated Passenger Railway, all of which will represent dollar for dollar the cash paid in, and which will be subject only to the \$10,000,000 mortgage bond issue now on said property.

"We may say in passing that we had already pledged our equity in this road with the Union Traction Company, and the Union Traction Company directors are only willing to recommend this plan of financing provided there is made over to them absolutely the ownership of this road, subject to pledge for the new loan, the Philadelphia Rapid Transit Company retaining its interest as lessee without additional fixed charges for the balance of the 999-year term of its Union Traction lease.

"We construe your second condition to mean that no part of the proceeds of the \$10,000,000 of bonds thus provided for the capital needs of the company shall be used to meet the operating expenses, interest and rentals of the Philadelphia Rapid Transit Company, but the whole of the said fund shall be reserved for future improvements and the refunding of accruing capital obligations where the same may be necessary. And we understand that you would require as an essential feature of the policy of this company that there should go back into the property each year for maintenance and renewal of property an amount equal to 15 per cent of its gross receipts, which is about 3 per cent more than is being appropriated by the company at this time for this purpose.

"A careful estimate of the condition of our treasury shows that the Philadelphia Rapid Transit Company has available working capital to meet any future deficits or contingencies of from \$1,500,000 to \$2,000,000. We believe that the existence of such a fund is a sufficient guarantee that no part of the new capital would have to be drawn on for operation, maintenance, interest or rentals. If you agree with us that these resources are sufficient to meet these requirements, we will, upon receiving your assent, proceed to call together the stockholders of the two companies for final action, and also bring the matter to the attention of City Councils and request their assent to the plan."

It is generally understood that Thomas E. Mitten, president of the Chicago (Ill.) City Railway, will be elected a director of the Philadelphia Rapid Transit Company, as an associate of Mr. Stotesbury.

Columbus, Marion & Bucyrus Railroad, Delaware, Ohio.—It is said that plans have been practically completed by which the Columbus, Marion & Bucyrus Railroad will be taken out of the hands of Receivers Guthrie and Whysall. Notices have been sent out by the directors of the company that a special meeting of the stockholders will be held in Marion on Dec. 31, 1910, at which the approval will be asked for an increase in the capital stock of the company from \$500,000 to \$600,000, all of the new stock to be preferred. The new stock is to be used to pay bonds issued by the company and to take up other liabilities. The company has \$500,000 of bonds outstanding and it is said that an arrangement has been made with the bondholders by which the past due interest will be adjusted, the bonds changed and the preferred stock issued in lieu of part of them.

Louisville & Eastern Railroad, Louisville, Ky.—The date of the sale of the property of the Louisville & Eastern Railroad under foreclosure has been fixed for Jan. 3, 1911, at Lyndon, Ky. It is generally understood that the Louisville Railway, which has taken over most of the outstanding claims against the company, will purchase the property.

Massachusetts Electric Companies, Boston, Mass.—P. F. Sullivan, president of the Boston & Northern Street Railway, has filed with the Secretary of the Commonwealth of Massachusetts a petition for legislation to authorize the Boston & Northern Street Railway to purchase the franchise and property of the Old Colony Street Railway on terms agreed upon by a majority of the board of directors and approved by a majority in interest of the stockholders of each road and by the Railroad Commission.

Oakland (Cal.) Traction Company.—The stockholders of the Oakland Traction Company will vote on Dec. 31, 1910, upon the question of creating a new bonded debt to the amount of \$250,000 for the purpose of purchasing rolling stock.

Sandusky, Mansfield & Norwalk Electric Railway, Norwalk, Ohio.—The Guarantee Title & Trust Company, Pittsburgh, Pa., has brought suit in the United States Court, at Toledo, Ohio, to foreclose a mortgage of \$600,000 on the Sandusky, Norwalk & Mansfield Electric Railway. The petitioner holds \$200,000 of the bonds. Judge Killits instructed counsel for the company to show cause, on Dec. 28, 1910, why a receiver should not be appointed.

Sunday Creek-Hocking Traction Company, Nelsonville, Ohio.—The Sunday Creek-Hocking Traction Company has decided to issue bonds to the amount of \$200,000 to secure funds to construct extensions in 1911. The Columbus Savings & Trust Company will be the trustee under the mortgage which will be given to secure the bonds.

West Chester, Kennett & Wilmington Electric Railway, Kennett Square, Pa.—The West Chester, Kennett & Wilmington Electric Railway defaulted in the payment of the coupons of its first mortgage 5 per cent bonds, dated 1905, and due in 1935. The total authorized issue of these bonds is \$1,000,000, of which \$420,000 is outstanding. As a result of the default a protective committee consisting of R. J. Brunner, George B. Atlee, Morris Ebert and William S. J. Wetherill has been formed, and has asked deposits of the bonds with the Girard Trust Company, Philadelphia, Pa., as depository. The committee is given power to formulate and carry out a plan of reorganization, but it cannot assess the bondholders in excess of 3 per cent to raise funds to meet its expenses.

Dividends Declared

Chattanooga Railway & Light Company, Chattanooga, Tenn., quarterly, 1¼ per cent, preferred.

Frankford & Southwark Passenger Railway, Philadelphia, Pa., quarterly, \$4.50.

Louisville (Ky.) Traction Company, quarterly, 1 per cent, common.

Portland Railway, Light & Power Company, Portland, Ore., quarterly, 1¼ per cent, preferred.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., quarterly, 1¼ per cent, preferred.

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

United Traction & Electric Company, Providence, R. I., 1¼ per cent, quarterly.

Traffic and Transportation

Circular to Employees

S. M. Felton, president of the Chicago Great Western Railroad, Chicago, Ill., recently addressed a circular on discipline to the employees of that company in which he said in part:

"It is the policy of the present administration to gain the friendship and good will of every man in the service. While strict discipline must be enforced as indispensable to an efficient operation of the property, every effort will be made to show due consideration for and promote the personal interests of deserving employees. Every employee is expected to use his best efforts toward the harmonious working of the organization. In dealing with the company he should be loyal, honest and straightforward. He must do his duty willingly and to the best of his ability. He should cultivate respect for his immediate superiors. He must co-operate with those above him in the line of service, as well as with those who are subordinate. Good team work is most essential to individual success, as well as to that of the company. Therefore, consider yourself a part of the machinery of the organization and endeavor not to diminish its effectiveness by the slightest neglect. Work first, last and all the time for the Chicago Great Western Railroad.

"In dealing with the public be courteous and accommodating. Remember it costs you nothing to be polite and attentive to the company's customers and to those whose business we hope to secure. Discourtesy or incivility will do more damage to our reputation than we can overcome in a long time by solicitation and other means. A kind word and attention take but little time and accomplish much in establishing a good reputation for the company and its employees. Go out of your way to help a customer, even though the road may not be able to furnish the facilities he asks for. In many cases the local agent of the company is its sole representative in the town where he is located. The estimate put on this man by his fellow citizens must be the measure of the company's popularity or unpopularity. Impress upon each patron the fact that you are giving his business your personal attention. If there is any complaint or delay and you are unable to remedy it yourself, advise your superior officer immediately. The company has recently expended millions of dollars for betterment of its roadway, equipment and train service, and from now on our service in all respects will be unexcelled. Do not leave it to the company's solicitors to impress this fact on all. Each employee has his own sphere of influence and every man should do his part to the end that the 'Great Western' may enjoy the business to which its improved facilities and service entitle it. Unless a railroad is prosperous its employees cannot permanently be prosperous."

Decision in Regard to Fares Between Abington and Brockton

The Railroad Commission of Massachusetts has handed down the following decision in regard to the petition of the Selectmen of Abington relative to the fare on the Old Colony Street Railway between Abington and Brockton:

"The present established fares of the Old Colony Street Railway provide for a 5-cent service in Abington and a ride from the post office in that town to the center of Brockton. The petitioners allege that a change in the latter rate should be made by increasing the distance that may be traveled for 5 cents and direct the attention of the board to other fares in the vicinity.

"After hearing and a further examination of the local conditions in and about Brockton and vicinity, including Abington, the board is unable to reach the conclusion that the existing fare complained of is unreasonable. The local fare between Abington post office and Brockton, taken in connection with special workmen's tickets issued for travel in the vicinity, and established rates of fare for like or similar service in the area served by the Old Colony Street Railway elsewhere, show no substantial inequalities.

"Of course it must be understood that it is practically impossible, in view of local conditions throughout the com-

monwealth, to determine the reasonableness of rates for street railway fares exclusively upon the proposition of mileage. We appreciate, however, that the issue presented is a close one and a substantial increase in travel and the consequent increase in revenue might lead us to an opposite conclusion.

"While we make no recommendation at this time, the case may be continued with leave to the petitioners again to bring the matter to the attention of the board when substantially different conditions develop."

Stools in Louisville.—The Louisville (Ky.) Railway has decided to allow its motormen to use stools during parts of their runs.

Car License Ordinance in Paterson.—The Aldermen of Paterson, N. J., have passed the ordinance which provides that a tax of \$25 a year shall be imposed for each street car operated in Paterson.

Fender Ordinance in South Bend.—The Common Council of South Bend, Ind., has passed an ordinance which requires that all street cars operated in South Bend shall be equipped with fenders after April 1, 1911. A fine of \$5 to \$200 a day is provided for violation.

Indianapolis & Louisville Traction Company Establishes Through Service.—The Indianapolis & Louisville Traction Company has established through limited service between Indianapolis, Ind., and Louisville, Ky., and has added a service to Dayton, Ohio. The company sells through tickets and checks baggage less than 150 lb. through to destination.

Transporting Mail Carriers in Little Rock.—At a meeting of the City Council of Little Rock, Ark., on Dec. 5, 1910, the City Council passed unanimously an amendment to the franchise granted to the Little Rock Railway & Electric Company in 1901, which relieves the company of the obligation to transport mail carriers free when attired in the regulation uniform. The amendment took effect at once.

Excursion Business Between Bangor and Stockton Springs.—John R. Graham, president of the Bangor Railway & Electric Company, Bangor, Me., has announced that he proposes to take up with the Bangor & Aroostook Railroad the question of excursion business between Bangor and the seashore by electric cars from Bangor to Northern Maine Junction and thence by motor cars over the steam railroad to Stockton Springs, a distance of 31 miles.

Complaint About Need of Shelter at Gear's Corners.—The Public Service Commission of the Second District of New York has received a complaint from residents of Gear's Corners in Pittsford, Monroe County, against the Rochester & Eastern Rapid Railway, asking that a shelter be provided at Gear's Corners and that the stop be designated as Long Meadow. The company has advised the commission that it will erect a shelter at the point in question after Jan. 1, 1911.

Freight Congestion in Indianapolis.—On account of the congested condition of the Indianapolis freight terminals the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., has issued the following notice: "Effective Dec. 10, 1910, all consignments of freight and interurban express not claimed and taken from freight house or express office within four days after arrival will be sent to storage house, subject to freight, drayage and storage charges."

Extension of Time in Joint Rate Case in New York.—The Public Service Commission of the First District of New York has granted an extension of time until Dec. 25, 1910, to the Metropolitan Street Railway and the Central Park, North & East River Railroad in which to establish joint rates for the transportation of passengers as provided in the order of the commission dated Aug. 2, 1910. The proceedings in this case were reviewed in the *ELECTRIC RAILWAY JOURNAL* of Dec. 10, 1910, page 1171.

Louisville & Eastern Railroad Wins Suit.—The Louisville & Eastern Railroad, which recently placed an extension to Shelbyville, Ky., in operation, has defeated the attempt of Shelbyville to prevent it from erecting a station within the city limits. The city claimed that the company had not

complied with its contract relative to the construction of the road. The case was carried to the United States Circuit Court of Appeals at Cincinnati from the Federal Court at Louisville. Both decisions were favorable to the company.

Wages in Providence.—The Rhode Island Company, Providence, R. I., established on Nov. 1, 1910, the following rates of pay per hour for motormen and conductors in its employ: First year, 21¼ cents; second year, 22¼ cents; third year, 23 cents; fourth year, 24½ cents; fifth year, 26 cents; sixth year and after, 27 cents. The rates of pay per hour for motormen and conductors of the company prior to Nov. 1, 1910, follow: First year, 21½ cents; second year, 22 cents; third year, 22½ cents; fourth year, 23½ cents; fifth year, 24½ cents; sixth year and after, 26 cents.

Complaint Against Western New York & Pennsylvania Traction Company.—The Public Service Commission of the Second District of New York has received a complaint from residents of Bolivar, Allegany County, protesting against the equipment, track and service of the Western New York & Pennsylvania Traction Company, Olean, N. Y., in Bolivar. It is stated that the track is unsafe; that the schedule calls for one car every 80 minutes to travel 18 miles; that the company has failed to arrange to meet trains in Olean, and that the rolling stock is inadequate and not fit for service.

Complaint About Service in Alexandria Bay.—The Public Service Commission of the Second District of New York has received a complaint from the trustees of Alexandria Bay against the St. Lawrence International Electric Railroad & Land Company. It is alleged that the tracks of the company in Alexandria Bay are not properly ballasted; that it is dangerous for vehicles to cross the tracks in their present condition; that the car stand of the company is on Market Street, one of the narrowest streets in the village, and that freight cars which are not in use are left standing and make the street almost impassable for teams.

Strike in Massachusetts.—A number of conductors and motormen in the employ of the Connecticut Valley Street Railway, Greenfield, Mass., went on strike on the evening of Dec. 7, 1910, because the company refused to reinstate several men who had been discharged for breaking the rules of the company. The company continued to operate its cars with the men who remained loyal to the company, and on Dec. 10, 1910, the men who went on strike agreed to return to work unconditionally pending a settlement of the differences between them and the company. The company reserved the right to hire men irrespective of their affiliations.

Reasons for Abandoning Ferries in New York.—Frank L. Sheppard, general superintendent of the Pennsylvania Railroad, explained recently to a delegation from Jersey City that the company abandoned the Twenty-third Street and Brooklyn Annex ferries because they had not paid since the opening of the Hudson & Manhattan Railroad between New York and New Jersey. There was not money enough in the vehicular traffic to warrant the operation of the ferries. Extra boats had been placed on the other ferry lines to accommodate teams. Mr. Sheppard holds that there is no legal requirement for the continuation of the Twenty-third Street and Brooklyn Annex lines.

Prizes to Section Men.—The Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind., has announced the result of its annual contest among its section foremen. Foreman D. Welch, of section 13, was awarded a prize of \$50 for the best line surface and level maintained. Foreman John Goguel, of section 5, was awarded \$40 for the second best section, and Foreman John Akers, \$25 for the third best section. Foreman G. M. Frye, section 1, was awarded a prize of \$50 for the section operated with the least relative expense during the year, and W. H. Sutton, of section 9, the second prize of \$25. There are 21 sections. Near the close of the year all the foremen are taken over the line in a special car, committees being appointed from their number to observe and grade the various points of excellence. The officers of the company figure out the averages and award the prizes according to the figures.

Reduction of Fare Asked on the Rochester, Syracuse & Eastern Railroad.—The Brightford Heights Land Company, Rochester, N. Y., has asked the Public Service Commission

of the Second District of New York to issue an order reducing the fare of the Rochester, Syracuse & Eastern Railroad between Stop 8 and the Rochester city line in either direction from 10 cents to 5 cents. The distance from the city line of Rochester to Stop 8 is about 2.25 miles. It is charged that the company has divided its line into so-called zones so that the zone or zones from the Rochester city line to and including Stop 8, for which fares are fixed at 5 cents, are too short, thereby making the fares unjust. It is further charged that there is discrimination against passengers traveling from Rochester to Stop 8 and that Stops 7 and 8 are in the same fare zone and that from the city line a fare of 5 cents is charged to Stop 7.

Attempt to Limit Car Capacity in Kentucky.—Arguments were heard before Judge M. L. Haberson on Dec. 2, 7 and 8, 1910, on the application of the South Covington & Cincinnati Street Railway for an injunction to prevent the City of Covington, Ky., from putting into effect an ordinance regulating the number of people to be carried on the cars of the company. Attorney Cassatt for the company stated that it would be impossible to obey the terms of the ordinance, which require that cars shall carry only one-third more people than can be seated; that the people could not be carried during the rush hours, and that the ordinance is invalid, as the cars operate in Cincinnati, Ohio, as well as in Kentucky, and a question of interstate commerce is involved. James C. Ernst, president of the company, and Thomas M. Green, superintendent, explained that it would be impossible to put the ordinance into effect, and that longer cars could not be used on account of a contract with the company owning the bridge across the river. Mr. Ernst showed that the company had purchased 65 new cars since he has been its president, and that it is operating 142 cars. To place guard railings in the front vestibule would make it impossible for people to board or leave the cars at that end. The passage of the ordinance by the Council was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 3, 1910, page 1129.

Increase in Wages in Little Rock.—The Little Rock Railway & Electric Company, Little Rock, Ark., has announced an increase in the wages of its motormen and conductors, effective Jan. 1, 1911, of 1 cent an hour for men who have worked for the company for from one to five years, and an increase of 2½ cents an hour for those who have been in the service of the company eight years or more. The wage scale per hour in effect at present follows: First year, 17 cents; second year, 18 cents; third year, 19 cents; fourth year, 20 cents; fifth, sixth, seventh, eighth and ninth years, 21 cents; tenth year and after, 22½ cents. The wage scale per hour which will become effective on Jan. 1, 1911, follows: First year, 18 cents; second year, 19 cents; third year, 20 cents; fourth year, 21 cents; fifth, sixth and seventh years, 22 cents; eighth year and after, 25 cents. In announcing the increase D. A. Hegarty, vice-president, treasurer and general manager of the company, addressed a circular to the employees, in which he said in part: "On account of the loyal and honest service given by you in the past the officials of the Little Rock Railway & Electric Company wish to show their appreciation of the same by voluntarily granting an advance in wages, beginning Jan. 1, 1911. In granting this increase the company is paying its motormen and conductors wages as high as are paid the platform men in larger cities where living expenses are much higher. This will increase the operating expenses, but we cannot increase our revenue by increasing the rate of fare, which is fixed by ordinance. We expect that the men benefited by this increase will give honest, loyal service and strict attention to their duties and the rules of the company. That will in a measure prevent and curtail the expense for accidents, one of the greatest drains on the company's resources. Through your polite attention to the patrons it will keep the present friendly feeling of the public toward the company. The proper handling of the company's equipment will cut down accidents to machinery, thereby reducing our repair bills. The proper handling of the equipment by the motorman in feeding and operating his car will help the company to save power. The company has always given you a square deal, and all it asks is your co-operation in the way of giving the company a square deal on your part. This can be done by complying with the above request."

Personal Mention

Mr. L. O. Lieber has resigned as electrical engineer of the Los Angeles & Redondo Railway, Los Angeles, Cal., and the position has been abolished.

Mr. C. W. Curtis has been appointed general foreman of the Los Angeles & Redondo Railway, Los Angeles, Cal., in charge of the power department, with offices in Belvidere, Cal.

Mr. Martin A. Knapp, chairman of the Interstate Commerce Commission, has been nominated by President Taft to be a judge of the new Court of Commerce for a term of five years.

Mr. J. H. Pardee, operating manager of J. G. White & Company, Inc., New York, N. Y., has been elected a vice-president of the Albany & Southern Railroad, Albany, N. Y.

Mr. W. G. Thomas has been appointed assistant to Mr. W. H. Smaw, purchasing agent of the Georgia Railway & Electric Company, Atlanta, Ga. Mr. Thomas was formerly storekeeper with the company.

Prof. B. H. Meyer, chairman of the Wisconsin Railroad Commission, and **Mr. C. C. McChord**, of Kentucky, have been nominated by President Taft to be members of the Interstate Commerce Commission.

Mr. J. L. McLean has been appointed dairy traffic agent of the Illinois Traction System with headquarters at St. Louis, Mo. Mr. McLean was formerly with the Chicago & Alton Railroad in the same capacity.

Mr. H. A. Benedict, whose connection with the Public Service Railway, Newark, N. J., was mentioned in this column last week, will be mechanical engineer of the company. Mr. Benedict's appointment became effective Dec. 15.

Mr. W. H. Smaw has been appointed purchasing agent of the Georgia Railway & Electric Company, Atlanta, Ga., to succeed **Mr. G. B. Graves**, resigned. Mr. Smaw has been connected with the company for eight years as a clerk and as assistant purchasing agent.

Mr. Frank L. Neff has been appointed general manager of the Indiana County Street Railway, Indiana, Pa., to succeed **Mr. F. E. Pritchard**. Mr. Neff was formerly connected with the electrical department of the Rochester & Pittsburgh Coal & Iron Company.

Mr. John M. Scott, who has been connected with the Kansas City Southern Railway, Kansas City, Mo., has been appointed chief of the inspection department of the Railroad Commission of Indiana. Mr. Scott began his railway career as a telegrapher. He was formerly connected with the Cincinnati, Hamilton & Dayton Railroad.

Mr. Horace Lowry has resigned as superintendent of the Minneapolis Division of the Twin City Rapid Transit Company, Minneapolis, Minn., to look after the real estate and investment features of his mother's (Mrs. Thomas Lowry's) estate. **Mr. L. S. Cairns**, general superintendent of the company, will, for the time being at least, perform the duties with the Minneapolis Division which Mr. Lowry has relinquished.

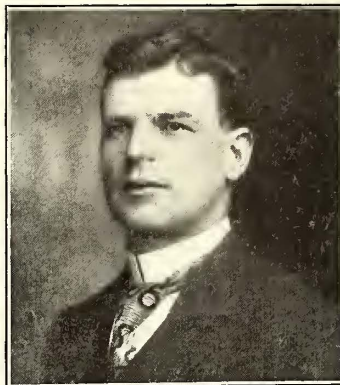
Mr. H. P. Crouse has been appointed secretary to **Mr. J. M. Egan**, president of the Metropolitan Street Railway, Kansas City, Mo., to succeed **Mr. J. H. Harvey**, who has been appointed superintendent of employment of the company, as noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 10, 1910. Mr. Crouse is a native of Wayne County, Ohio, and has spent practically all of his active life in newspaper work, largely in connection with railroad matters.

Mr. J. F. Van Keuren has been appointed acting superintendent of the Lansingburg division of the United Traction Company, Albany, N. Y., to succeed **Mr. J. C. Thompson**, who, as noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 10, 1910, has been appointed general superintendent of the Trenton (N. J.) Street Railway. Mr. Van Keuren held the positions of conductor, inspector and claim investigator with the company previous to his appointment as acting superintendent of the Lansingburg division.

Mr. Fletcher M. Durbin has resigned as general manager of the Evansville & Southern Indiana Traction Company, Evansville, Ind., to become connected with the operating

department of J. G. White & Company, Inc., New York, N. Y., effective on Jan. 1, 1911. Mr. Durbin was graduated from Williams College in 1903 and immediately became connected with the operating department of the Indianapolis Traction & Terminal Company, Indianapolis, Ind. In 1904 he was appointed assistant superintendent of the Indianapolis Traction & Terminal Company and continued in that capacity until November, 1907, when he accepted the position of general manager of the Evansville & Southern Indiana Traction Company.

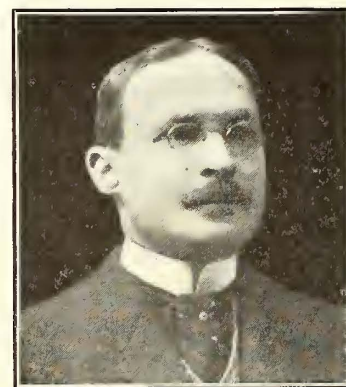
Mr. Frank P. Maize, general shop foreman of the Plank Road shop of the Public Service Railway, has been appointed superintendent of shops of that company. Mr. Maize began his railway career in the shops of the Carlisle



F. P. Maize.

Manufacturing Company, locomotive builders, with which he was connected from 1885 to 1893. In 1893 he became foreman of the machine shop of the Atlantic Avenue Railroad, Brooklyn, and in 1894 he accepted a similar position with the Scranton (Pa.) Traction Company. While in Scranton Mr. Maize took the course in mechanical and electrical engineering with the International Correspondence School of Scranton. In 1896 he resigned from the Scranton Traction Company to become foreman of the repair shops of the second division of the Union Traction Company, Philadelphia. A year later he was appointed master mechanic of the New York & Queens County Railway, Long Island City, New York, and in 1900 he was made superintendent of power houses and equipment of the company. From 1903 until August, 1908, Mr. Maize acted as master mechanic of the Rochester (N. Y.) Railway. Mr. Maize has patented a number of railway appliances, among them an oil cup which is in use on a number of roads.

Mr. Arthur L. Linn, Jr., who was appointed assistant auditor of the New York Central & Hudson River Railroad and auditor of its subsidiary lines on Feb. 1, 1910, has been connected with electric railways for many years.



A. L. Linn, Jr.

He started as assistant bookkeeper of the Cleveland Electric Railway in 1893 and remained with that company until 1898, when he was appointed assistant auditor. He remained in that position for three years and then resigned to take the office of assistant treasurer, auditor and assistant secretary of the Utica & Mohawk Valley Railway and subsidiary lines at Utica, N. Y. He resigned his connection with that company in 1905 to become general manager of the Fairmont & Clarksburg Traction Company, Fairmont, W. Va. In the next year he came to New York City as general auditor of the street railway and power companies controlled by the New York Central & Hudson River Railroad in New York State. He was also secretary and assistant treasurer of a number of the subsidiary companies and was general auditor of the Mohawk Valley Company, which was organized to hold temporary control of certain properties. Later some of the properties were segregated and a new organization was perfected. In 1909 Mr. Linn was made general auditor and assistant secretary of the New York State Railways. Under the present organization, besides assuming new duties with the New York Central & Hudson River Railroad as assistant auditor and auditor of about 50 subsidiary companies, he continues to exercise supervision over the accounts of

the subsidiary electric railway and power companies in the State. Mr. Linn has been a vice-president of the American Street & Interurban Railway Accountants' Association, and has been an active member of some of its committees.

Mr. F. D. Gatchell resigned recently as superintendent and purchasing agent of the Charlotte Electric Railway, Light & Power Company, Charlotte, N. C., to become manager of the office of The Texas Company at Charlotte. Mr. Gatchell was employed by the International Railway, Buffalo, N. Y., from 1897 to 1900 as switchboard operator and engineer at its Niagara Street power station. From 1900 to 1904 he was electrical engineer of the Buffalo Furnace Company, and from 1904 to 1907 he was superintendent and electrical engineer of the Gulfport & Mississippi Coast Traction Company, Gulfport, Miss. Mr. Gatchell resigned from the Gulfport & Mississippi Coast Traction Company to become connected with the Charlotte Electric Railway, Light & Power Company.

Mr. J. E. Gibson, assistant to Mr. J. M. Egan, president of the Metropolitan Street Railway, Kansas City, Mo., has been appointed general superintendent of the company. Mr. Gibson entered the service of the Metropolitan Street Railway as a clerk in the office of the auditor. On Jan. 1, 1905, he was appointed secretary to Mr. Bernard Corrigan, who was then president of the company, and he continued in this capacity until March 1, 1909, when he entered the service of the operating department of the company as a division superintendent. In June, 1910, he was appointed assistant to Mr. Egan. Mr. Gibson was born in Kansas City, Mo., on Aug. 20, 1881, and was educated in the public schools of that city and at the Missouri State University at Columbia, Mo., from which he was graduated in 1902. From 1902 to 1904 Mr. Gibson served as private secretary to Mr. W. S. Cowherd, Congressman from the Fifth Missouri District, in Washington.

OBITUARY

John H. Barker, president of the Haskell & Barker Company, Michigan City, Ind., is dead.

L. P. Rowan, assistant superintendent of the Schuylkill Valley Traction Company, Norristown, Pa., is dead.

Thomas F. Downing, secretary and treasurer of the Chicago Car Heating Company, Chicago, Ill., died on Dec. 5, 1910, from a cerebral hemorrhage which resulted from a street car accident in June, 1910. Mr. Downing was 30 years old. He had been connected with the company since its organization in 1903.

The Massachusetts Railroad Commission gave a hearing on Dec. 12, 1910, on the appeal of the Boston (Mass.) Elevated Railway from the action of the Boston Transit Commission in determining station locations in the Riverbank subway at Charles Street, Dartmouth Street and Massachusetts Avenue. The Riverbank subway, as authorized by law, is shortly to be built from Park Street, Boston, to the Charlesgate district of the Back Bay, the route lying under Beacon Hill and the embankment recently built on the south border of the Charles River Basin.

C. S. Sergeant, vice-president of the Boston Elevated Railway, emphasized the fact that the distance between the proposed Massachusetts Avenue station and the subway outlet was only 915 ft. At the point where the station was desired there was a down grade inward bound of 3.15 per cent, which the company desired to use in accelerating cars running to the heart of the city. Even after the subway was completed it would be necessary to run many surface cars on Boylston Street and the present transfer arrangements to and from Cambridge were preferable to new ones involving stairway climbing and the use of underground facilities. The intermediate stations would prevent the company from making a quick run in the subway, which was designed to shorten the running time of outlying suburban passengers by 5 or 10 minutes. About 50,000 people would be delayed to benefit, perhaps, 3,000 persons.

Mayor Fitzgerald of Boston urged the construction of three stations if the Riverbank subway was built according to present plans, but suggested that a subway under Boylston Street would fill the needs of the city's development better.

Construction News

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

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

RECENT INCORPORATIONS

***City Railway, Los Angeles, Cal.**—Incorporated in California to construct certain lines in Los Angeles in the interests of the Los Angeles Railway. Capital stock, \$5,000,000. Directors: Howard E. Huntington, George C. Ward, C. A. Henderson, J. E. Brown, W. E. Dunn, S. M. Haskins and Albert Crutcher.

***St. Simons Railway Company, St. Simons Island, Ga.**—Chartered in Georgia to build an electric or steam railway on St. Simons Island from Ocean Pier on the western part of the island to a point where Pastell and Black Bank Creek flow into the Atlantic Ocean on the eastern side of the island. Also a line from the initial point to a point near Frederica River, a distance of about four miles. Capital stock, \$20,000. Incorporators: M. Kiser, New York, and Frank D. Aiken, A. Fendig, F. D. Strahan, J. B. Wright, H. F. Dunwoody, J. H. Whitmire, W. J. McPherson, George H. Smith and Newton H. Walker, all of Brunswick.

***Spray Utilities & Terminal Company, Spray, N. C.**—Chartered in North Carolina to build railways and develop water power. Capital stock, \$500,000. Incorporators: S. H. Marshall, E. V. Hobbs and N. H. McCollum.

***Halite & Northern Railroad Company, Albany, N. Y.**—Incorporated in New York to build a four-mile steam or electric railway in Halite. Capital stock, \$100,000. Directors: William A. Hazard, Edward W. Brown, Ashley Bigelow and Duncan A. Holmes, of New York; Wilton W. Sealby, Harry S. Keating, Brooklyn; Gouverneur O. Parks, Sheepshead Bay; Edwin M. Bennit, Hackensack; Herbert G. Buckley, Corona.

***Buckeye Lake Railway Terminal & Transportation Company, Millersport, Ohio.**—Incorporated in Ohio to build an electric railway in Millersport on Buckeye Lake. Capital stock, \$15,000. Incorporators: A. E. Boone, H. A. Axline, J. L. Holden, Julius Hollinger and Lawrence Kliner.

***Portland Subway Company, Salem, Ore.**—Incorporated in Oregon to build a subway under the Willamette River at Portland. Capital stock, \$100,000. Incorporators: L. Y. Keady, A. E. Hammond and A. K. Bentley, all of Portland.

***Farmers Electric Railway, Vale, Ore.**—Application for a charter has been made in Oregon by this company to build an electric railway in Vale and extend it to the Malheur Canyon and eventually to Ontario. Incorporators: R. D. De Armond, Fred L. Johnson, Vale, and G. W. Thomas, Ontario.

***Bellevue (Wash.) Electric Company.**—Incorporated in Washington to build an electric railway from Bellevue to Lake Sammamish. Capital stock, \$500,000. Incorporators: E. P. Morgan, H. L. Collier and Frank J. Moran. Headquarters: 193 Twenty-seventh Street, Seattle.

FRANCHISES

Marysville, Cal.—The Northern Electric Railway, Chico, has received a franchise from the City Council to build its tracks across F and Third Streets to reach the site of the new depot on E Street between Second and Third Streets in Marysville.

San Diego, Cal.—The San Diego Electric Railway has received a franchise from the Council to extend its line on Fifteenth Street between A Street and B Street in San Diego.

***Brandon, Man.**—A Vancouver syndicate has asked the Council for a franchise to build an electric railway in Brandon. It offers to build at once if given a reasonable franchise.

Hagerstown, Md.—L. N. Downs and H. L. Kirby, representing the Hagerstown & Clearspring Railway, have received a franchise to build its tracks along the Hagerstown and Conococheque Turnpike from Hagerstown to Conococheque Creek. [E. R. J., Dec. 3, '10.]

Salisbury, Md.—The Wicomico Electric & Power Company has asked the City Council for a franchise to build a railway through Salisbury. This proposed 25-mile electric railway will connect Salisbury, Quantico, Roaring Point, Hebron, Bivalve and Nanticoke. M. V. Brewington, president. [E. R. J., Nov. 5, '10.]

Springfield, Mass.—The Hartford & Springfield Street Railway will apply to the General Assembly of 1911 for the right to operate a railway in Enfield and Somers.

Worcester, Mass.—The Worcester & Providence Street Railway has received a franchise to build a railway in Worcester. It will connect Worcester, Providence, Millbury and Sutton. William E. Horne is interested. [E. R. J., Apr. 16, '10.]

***Anoka, Minn.**—The Anoka-Minneapolis Suburban Railway Promotion Company has received a franchise from the County Commissioners to build railways over the Rum River Bridge at Anoka and over the United States military road running from Point Douglas to Fort Ripley, from the city limits of Minneapolis to the city limits of Anoka.

Bloomfield, N. J.—The Public Service Railway has received a franchise to connect its Orange and Passaic line with the Bloomfield Avenue line to give Bloomfield direct service to Newark.

Lambertville, N. J.—The New Jersey & Pennsylvania Traction Company, Trenton, has asked the City Council for a franchise to build its railway through Lambert Street in Lambertville to reach a new freight station which is to be built.

Asheville, N. C.—The Isothermal Traction Company, Rutherfordton, has asked the Board of Aldermen for a 60-year franchise to build its tracks into Asheville from Biltmore. This proposed 50-mile railway will connect Rutherfordton and Gastonia. J. F. Flack, Rutherfordton, secretary. [E. R. J., Nov. 19, '10.]

Dayton, Ohio.—The City Railway will ask the City Council for a franchise to build an extension of its Kammer Avenue line in Dayton.

Johnson City, Tenn.—The Johnson City Traction Company has received a franchise from the City Council to extend its lines to the Normal Building in the southwest addition in Johnson City.

***Victoria, Tex.**—D. D. Fairchild, San Antonio, and associates, have applied to the City Council for an electric railway franchise in Victoria.

Bismarck, Wash.—The Tacoma Railway & Power Company, Tacoma, will ask the Municipal Commission for a franchise to build an extension of its line from Tacoma to Bismarck, a distance of about 2 miles.

Lynden, Wash.—The Nooksack Valley Traction Company, Bellingham, has received a year extension of its franchise to build its tracks in Lynden. This projected line will connect Bellingham, Sumas, Ferndale, Lynden and Blaine. Samuel Alsop is interested. [E. R. J., Oct. 29, '10.]

***Seattle, Wash.**—Fred E. Sander, Seattle, will ask the County Commissioners for a franchise to build a seven-mile electric railway from Seattle to Lake Burien. This projected line will follow the projected route of the Seattle-Tacoma Short Line.

Tacoma, Wash.—The Tacoma Railway & Light Company will ask the Council for a franchise to build an extension of its tracks from Tacoma to Bismarck.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—It is stated that this company plans to electrify the Southern Pacific tracks from the Southern Pacific station to Oneonta tower and there have a double track connect with the inside tracks of the four-track system. It is expected to begin work the first of the year.

Fresno, Cal.—S. N. Griffith, Fresno, promoter of the proposed 50-mile electric railway to connect Fresno and Clovis, has awarded the contract to the Colorado Fuel & Iron Company for 10 miles of rails. [E. R. J., Dec. 10, '10.]

Ontario & San Antonio Heights Railroad, Ontario, Cal.—This company has completed the 6-mile extension of its line from Claremont through Upland to North Pomona. It will be placed in operation next January.

Geary Street, Park & Ocean Railway, San Francisco, Cal.—The Board of Works has awarded the Pennsylvania Steel Company the contract to furnish rails for this railway, which is to be reconstructed and to be municipally operated.

San Jose (Cal.) Railroad.—This company is now building about 25 miles of standard gage track and will expend about \$75,000 for special work. W. P. Lawson, manager.

Tidewater & Southern Railroad Company, Stockton, Cal.—This company has awarded the contract to T. K. Beard, Modesto, for constructing the roadbed between Stockton, Modesto and Turlock. Byron A. Bearce is interested. [E. R. J., Oct. 15, '10.]

Jacksonville (Fla.) Electric Company.—This company has begun work on an extension from Fort Myers to Labelle and Citrus Center.

***St. Augustine, Fla.**—J. J. Brophy, Pittsburgh, and associates are said to be considering plans for constructing an electric railway to connect St. Augustine, Tampa, Kissimmee and Sanford.

Macon Railway & Light Company, Macon, Ga.—This company plans to build an extension of its Vineville and South Macon line to Rice's Mill before July, 1911.

Boise & Interurban Railway, Ltd., Boise, Idaho.—This company is said to be considering plans to extend its line.

Alton, Jacksonville & Peoria Railway, Jerseyville, Ill.—This company is considering plans to build an extension of its line to Fieldon and Hardin. Good progress is being made on its extension between Godfrey and Jerseyville. The company has moved its central office from Jerseyville to Alton.

Springfield & Central Illinois Traction Company, Springfield, Ill.—This company, recently incorporated, has begun surveys for its proposed 110-mile electric railway from Springfield to Nashville. William J. Barrett is interested. [E. R. J., Nov. 5, '10.]

***Richmond, Ind.**—The Commercial Club, of Richmond, is promoting the construction of an electric railway from Richmond to Harrison, via Abington, Clifton, Cedar Grove, Liberty, Roseburg, Dunlapville, Quakertown, Tanfield, Brookville and New Trenton. Chas. W. Jordan, secretary.

Manhattan City & Interurban Railway, Manhattan, Kan.—The people of Manhattan have voted \$20,000 and the township of Ogden has voted \$10,000 to assist in building an extension of this railway between Manhattan and Fort Riley. Work will be begun at once. Joseph T. West, Manhattan, purchasing agent.

New Orleans Railway & Light Company, New Orleans, La.—This company is planning to extend its Claiborne line to St. Bernard.

Plymouth & Sandwich Street Railway, Manomet, Mass.—This company has completed preliminary arrangements and will begin construction in the spring on its proposed extension from Sandwich to Plymouth. This line now extends as far as Fresh Pond. N. H. Dunbar, Manomet, superintendent.

Detroit, Bay City & Northwestern Electric Railway, Detroit, Mich.—This company has been organized to build a line to connect Detroit, Utica, Romeo, Almont, Imlay City, Burnside, North Branch, Maysville, Caro and Bay City. From Burnside it is planned to build a branch to Marlette, Bad Axe and Harbor Beach. [E. R. J., Nov. 26, '10.]

Duluth (Minn.) Street Railway.—It is reported that this company has plans well under way for building an extension of its line to New Duluth and Fond du Lac.

Mexico, Santa Fe & Perry Traction Company, Mexico, Mo.—This company has begun the construction of its proposed line from Mexico to Columbia and Fulton. This projected 20-mile electric railway will connect Perry, Mexico City, Santa Fé, Hereford, Columbia, Fulton and Mokane, Mathias Crum, president. [E. R. J., Dec. 3, '10.]

St. Louis-Kansas City Electric Railway, St. Louis, Mo.—It is said that this company has begun surveys for its proposed railway from the Missouri River to Columbia via New Franklin and Rockport. J. Paul Price, Columbia, engineer. [E. R. J., Sept. 24, '10.]

***Wildwood & Delaware Bay Shore Line Railroad, Trenton, N. J.**—The Board of Public Utility Commissioners of New Jersey has approved the sale of \$500,000 capital stock and \$562,500 first mortgage gold bonds by this company, and has also approved the contract awarded by the company to the Detroit Engineering & Constructing Company to build and equip its proposed electric railway from a terminus in the Borough of Wildwood to a terminus in the county of Cape May on the eastern shore of Delaware Bay.

Brooklyn & Jamaica Bay Railroad, Brooklyn, N. Y.—This company has asked the Public Service Commission for a certificate of public convenience and necessity for building a 2½-mile electric railway from Liberty Avenue and Montauk Avenue, down Montauk Avenue to Railroad Avenue and Old Mill Creek, Jamaica. Horace J. Subers, 25 Broad Street, New York, president. [E. R. J., June 25, '10.]

Syracuse (N. Y.) Rapid Transit Railway.—In the hearing on the application of the Trustees of Solvay for an order requiring this company to extend its double tracks from Bridge Street to the present westerly terminus of the line an agreement was reached that the company would do the work within a year and a half.

Neuse-Trent Traction Company, Newbern, N. C.—This company advises that it is now ready to award contracts to build a 4-mile railway in Newbern. Construction is to begin in about 60 days. It expects to purchase power from the city power station. The repair shops will be located at Newbern. Capital stock, authorized, \$200,000. Bonds, authorized, \$100,000. Officers: A. E. Stevens, Newbern, president; C. W. Polvogt, Wilmington, N. C., vice-president; C. D. Bradham, treasurer; Eugene Williams, Newbern, superintendent, and T. A. Colvin, Newbern, chief engineer. [E. R. J., March 26, '10.]

***Cleveland, Ohio.**—Pittsburgh and Cleveland capitalists held a meeting at East Palestine, Ohio, and it is said that plans have been partially formulated for building an electric railway connecting Beaver Falls, Pa., Darlington, East Palestine and Columbiana, Ohio, making connection at Columbiana with the Youngstown & Southern Railway. At Leetonia this road connects with the Youngstown & Ohio River Railway & Light Company, which has its southern terminus at East Liverpool.

Columbus, New Albany & Johnstown Traction Company, Columbus, Ohio.—A. T. Herd, New York, who recently secured a controlling interest in the Columbus, New Albany & Johnstown Railway, through the purchase of its securities from Cincinnati banks: Judge Van Wyck, New York, and Colonel Pope, Parkersburg, W. Va., inspected recently the proposed extension from Gahanna to Johnstown. The Columbus, Mt. Vernon & Mansfield Traction Company, recently incorporated, is to take over this property, and it is believed that the line will eventually be extended to Mt. Vernon and Mansfield, where it will connect with the Cleveland, Southwestern & Columbus lines.

Springfield, Troy & Piqua Traction Company, Springfield, Ohio.—An effort is being made to induce this company to build a spur from the main line to St. Paris. The cost will be about \$34,000 and the plan is to have Springfield and St. Paris divide the cost.

Philadelphia & Chester Railway, Philadelphia, Pa.—This company is building a ½-mile extension of its tracks in Eddystone and a 2½-mile extension of its line to connect with the lines of the Philadelphia Rapid Transit Company. Joseph L. Gilbert, president. Headquarters, 605 Land Title Building, Philadelphia.

Montreal (Que.) Street Railway.—The Aldermen of Montreal have appointed a special committee to confer with the officers of this company in regard to the construction of new lines in the city, particularly the use to be made by the company of the subway right which it secured from the Legislature in 1909.

Yazoo & Mississippi Valley Railroad, Memphis, Tenn.—An organization of business men of Helena, through President Hornor of the Business Men's League, has made an offer to the Yazoo & Mississippi Valley Railroad in which it agrees to lease the branch of the line running from Trotter's Point, opposite Helena, to Jonestown, Miss. If the offer should be accepted by the company the Helena organization will electrify the entire branch, operating a train every hour.

Tennessee Rapid Transit Company, Nashville, Tenn.—This company is said to be making preliminary arrangements for building its proposed 110-mile electric railway to connect Lewisburg, Springfield and Clarksville. J. M. Gray is interested. [E. R. J., Sept. 10, '10.]

Texas City Traction Company, Texas City, Tex.—This company has awarded a contract to the Willow Lumber Company for ties, and the contract for rails to the Hyde Brothers, New York, to build its proposed 5-mile railway to connect La Marque, Nadeau, and Texas City, connecting at La Marque with the Galveston-Houston Interurban Railway. The company will operate 35 passenger motor cars. Officers: Fordyca Ridley, 101-2 Security Building, P. O. Box 365, Galveston; W. S. Broussard, secretary, and Edward Ketchum, superintendent. [E. R. J., Dec. 10, '10.]

SHOPS AND BUILDINGS

San Francisco, Oakland & San Jose Railway, Oakland, Cal.—This company expects to build a new depot on Twentieth Street and Adeline Street in Oakland.

Athens (Ga.) Electric Railway.—This company is building a new concrete car house in Athens. It is also rebuilding its lines in various portions of the city.

Boise & Interurban Railroad, Idaho.—This company will soon build a new depot in Caldwell.

Frederick (Md.) Railroad Company.—This company is building a car house in Frederick to be 107 ft. x 150 ft. It is also building a paint shop to be 45 ft. x 100 ft. which will contain six tracks.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—This company expects to soon build a new freight station in Lambertville. The structure will be 20 ft. x 40 ft.

Ohio Electric Railway, Cincinnati, Ohio.—A contract has been closed by this company for the purchase of the property in Springfield of the Springfield Pure Milk Company. The property will be used as a site for the location of a new freight depot.

POWER HOUSES AND SUBSTATIONS

Jacksonville (Fla.) Electric Company.—This company will build a new power house on Riverside Avenue, facing the St. John's River in Jacksonville, to take the place of the old plant now in operation near the viaduct.

Illinois Traction System, Champaign, Ill.—It is reported that this company expects to build a power house in Atchison in the spring. The cost is estimated to be about \$300,000.

East St. Louis & Suburban Railway, East St. Louis, Ill.—This company will construct a power house at Reeb Station, St. Louis. It will furnish power for the Belleville City line and additional power for the suburban system between Belleville and East St. Louis. Work will be begun at once. C. F. Hewitt, superintendent.

Frederick (Md.) Railway.—This company has just purchased and installed one 750-hp engine, one 400-kw a. c. generator and equipped three rotary substations complete.

Boston (Mass.) Elevated Railway.—Stone & Webster have obtained from the Boston Elevated Railway the contract for building the new power house in South Boston. It is proposed to erect a building which can be extended. A plant for unloading coal will be installed also, and storage accommodations for 100,000 tons of coal provided. It is expected that station, wharf, land and accessories will cost nearly \$3,000,000. About a month ago the company contracted with the General Electric Company for two 15,000-kw steam turbines, which will be installed in the new station, giving an initial capacity to the station of more than 40,000 hp.

Toledo Railways & Light Company, Toledo, Ohio.—This company has ordered from the General Electric Company one 1000-kw, 575-volt motor-generator set and one 1000-kw, 3-unit, 135-volt motor-generator set, with transformers and station equipment.

Niagara Falls, Welland & Dunnville Electric Railway, St. Catharines, Ont.—This company expects to build substations next spring at Niagara Falls, Welland and Dunnville. J. C. Gardner, Niagara Falls, is interested.

Manufactures & Supplies

ROLLING STOCK

San Jose (Cal.) Railroads is considering the purchase of about 15 cars.

Ft. Dodge, Des Moines & Southern Railroad, Boone, Ia., is reported to be in the market for two electric locomotives for hauling heavy freight equipment.

Columbus Railway & Light Company, Columbus, Ohio, has ordered four closed car bodies mounted on Brill No. 27-M.C.B.-1 trucks from the G. C. Kuhlman Car Company.

Texas City Traction Company, Galveston, Tex., which is building a line from La Marque to Texas City, has ordered two 35-passenger gasoline motor cars from the Sheffield Car Company.

Union Railway, New York, N. Y., has placed an order with The J. G. Brill Company for 100 cars, of the convertible type, similar to those used by the Third Avenue Railroad, New York.

Youngstown & Southern Railway, Youngstown, Ohio., is said to be considering the purchase of eight cars to be used in operating a half-hour schedule if it doubles its track between Youngstown and Leetonia.

Fairmont & Clarksburg Traction Company, Fairmont, W. Va., has ordered two combination baggage and smoking cars and two combination baggage and express cars mounted on Brill No. 27 trucks from the G. C. Kuhlman Car Company.

Frederick (Md.) Railroad has ordered one 37-ft. semi-convertible passenger and baggage car and one 31-ft. 8-in. semi-convertible passenger and baggage car from The J. G. Brill Company. Both cars will be mounted on Brill No. 27-M.C.B.-1 trucks.

East St. Louis (Ill.) Railway has on order with the McGuire-Cummings Manufacturing Company one double-end, double-truck combination snow sweeper and work car. It is to be equipped with four GE-70 motors mounted on McGuire-Cummings 6-ft. wheel base M.C.B. trucks, and a GE-800 motor for driving brooms, with K-28-B controller equipment for driving motors and K-10 controller for broom motor.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa., is in the market for two double-truck car bodies, without trucks, either semi-convertible or standard closed design, about 40 ft. long over all and 8 ft. 6 in. wide. The company wants car bodies without prepayment platforms, but with large platforms with doors and steps on both sides, reversible cross seats and four sand boxes. Weights of cars to be as low as consistent with safe operation over heavy grades and delivery for April 1, 1911.

TRADE NOTES

Ralston Steel Car Company, Columbus, Ohio., has authorized an increase in its capital stock from \$1,000,000 to \$2,500,000.

Owen Bearse & Son Company, Boston, Mass., has moved its offices from 33 Broad Street to the Post Office Square Building, 79 Milk Street, Boston.

Edgar Allen & Company, Ltd., Sheffield, Eng., has appointed Shrock & Squires, 291 Pearl Street, New York, as eastern agents for its high-grade tool steels.

T. H. Symington Company, Baltimore, Md., manufacturer of Symington journal boxes and Farlow draft gear, has elected S. L. Kamps secretary with general offices at Baltimore, Md.

Consolidated Car-Heating Company, New York, N. Y., has received the contract for installing heaters in the 50 surface cars recently ordered by the Boston Elevated Railway. This company will also install its buzzer systems in these cars.

Railway Specialty & Supply Company, Chicago, Ill., changed its name on Dec. 1 to the P. & M. Company. This change was made because of the frequent confusion of the old name with the numerous other supply and equipment companies in the railroad field.

American Carbon & Battery Company, East St. Louis, Ill., has recently acquired the plant and business of the

Doe Battery & Manufacturing Company, Kent, Ohio, and will continue the manufacture of Doe dry cells under the same name in connection with the manufacture of carbon and graphite products.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has received an order from the Stark Electric Railroad, Alliance, Ohio, to install 12 Stromberg-Carlson dispatcher's signals between Canton and Salem, Ohio. This system permits the dispatcher located at Alliance, Ohio, to set a signal against a crew at any selected point on the line in a few seconds' time, and each operation of the signals is automatically recorded at the dispatcher's office.

H. B. Logan, president of Dossert & Company, has been elected president of the American Oil Storage Company, a New Jersey corporation, capitalized at \$500,000, which has acquired the patent rights for the manufacture, sale and rentals of Keefe's patent sectional steel flange storage tanks. Mr. Logan is well known in electrical trade circles through his connection with the successful development of Dossert solderless connectors. He will continue at the head of Dossert & Company. The New York office of the American Oil Storage Company is at 74 Broadway.

Charles G. Armstrong, consulting engineer, New York City, has taken into partnership his son, Francis J. Armstrong, under the firm name of Charles G. Armstrong & Son. Charles G. Armstrong is known in engineering circles particularly in connection with the planning and construction of the Auditorium Hotel, Stock Exchange Building, Lake Shore Passenger Station and the Coliseum in Chicago, and the Singer Building and United States Express buildings in New York City. He is also the inventor of many of the modern office building devices, particularly the elevator signaling system manufactured by the Elevator Supply & Repair Company. Francis J. Armstrong is a graduate of the Manual Training School of the Chicago University and of the Stevens Institute of Technology.

Western Electric Company, New York, N. Y., has declared an extra dividend of 2 per cent, payable on Dec. 31, 1910, to stock of record on Dec. 24, 1910. With the regular 8 per cent dividend this makes 10 per cent for the year and gives the American Telephone Company as owner of 80 per cent of the \$15,000,000 stock additional income of \$250,000. Due to the change in date of the fiscal year from Nov. 30 to Dec. 31, the company has declared a dividend of 1 1/3 per cent, payable Dec. 31, 1910, covering the two months of November and December. Hereafter quarterly dividends will be paid Mar. 31, June 30, Sept. 30 and Dec. 31. The \$5,000,000 of 4 1/2 per cent 2-year notes have been called for payment Jan. 1, 1911, at 100 1/2 and long-term bonds sold to provide funds for redeeming the notes. When the notes are paid off and the bonds delivered, the company will have no debt except the \$15,000,000 of 5 per cent bonds.

ADVERTISING LITERATURE

Frank Ridlon Company, Boston, Mass., has issued its list of second-hand electrical machinery for December, 1910.

A. D. Joslin Manufacturing Company, Chicago, Ill., has issued a folder describing and illustrating its Cosmo dating stamp.

Western Electric Company, New York, N. Y., has issued bulletin 5500, describing and illustrating direct-current and alternating-current enclosed arc lamps.

National Wrecking & Machinery Company, Cleveland, Ohio, has issued a special list on a number of second-hand belted and direct-connected 500-volt generators ready for immediate shipment.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., is distributing a leather-bound booklet which contains a diary for 1911, blanks for memoranda and miscellaneous engineering data.

Ball & Wood Company, Elizabethport, N. J., announces in a new catalog that in addition to building Rateau-Smoot turbines of the high and low-pressure types, it is also building these turbines, which are of the impulse type, for mixed flow pressure. The new type consists of a straight low-pressure turbine with supplementary wheels to economically use high-pressure steam by means of an automatically controlled governor.