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Of this issue of the ELECTRIC RAILWAY JOURNAL 9000 copies are printed.

Hugh M. Wilson and Technical Journalism

As announced in our personal columns this week, Hugh M. Wilson, former proprietor of the *Electric Railway Review* and *The Railway Age*, has entered the manufacturing field, and we cannot chronicle this fact without expressing our appreciation of the high standards set and consistently followed by Mr. Wilson while engaged in technical newspaper work. He believed that to deserve and secure the support of the industries to which his journals were devoted they should not only record all of the important engineering and financial news in their respective fields, but

should also assist so far as they could in solving the important problems of every character with which these industries were confronted. In carrying out this plan, Mr. Wilson's policy was essentially constructive, and while he did not hesitate to criticize faulty methods, he aimed always to combine with this criticism suggestions which would be helpful in securing the reforms which he desired. His ideal of a technical journal was that it should be a force, and a potent one, in any direction in which it could be useful in the field to which its energies were devoted. His connection with railway journalism was beneficial to those who were subscribers to his papers, to the manufacturers of railway apparatus who advertised in them and to all others who were connected with the industry. His journalistic experience and the knowledge of the railroad field thereby gained should be of great assistance to him in the new work in which he has embarked, and in his career as a manufacturer he will have the best wishes of his former associates in journalism.

Third Avenue Reorganization Problems

Considerable interest is being excited in New York by the proposed plan of reorganization of the Third Avenue Railroad Company, as outlined by the bondholders' committee and published in these columns. Briefly, the scheme contemplates a larger total par value in securities than now exists, as stock will be issued for the cash assessment to be paid by the present stockholders and bonds for the unpaid bond interest, but the fixed charges will be reduced, so that it is estimated that the company will be able to earn the interest on its funded indebtedness. According to F. W. Whitridge, the receiver of the company, the stock will possess very little present value, but will represent the expectations of the owners in the future prosperity of the company. In some quarters, the plan has been termed an injection of water, but if this is the case, the definition of watered stock will have to be modified from that which is usually accepted for the term. No claim is made that any part of the stock has been issued for less than its par value or the bonds for less than about par. But, through a number of circumstances, some of which are due to obsolescence of equipment, and some to conditions over which the company had no control, the physical assets no longer equal the capitalization. The case differs materially from that of a solvent corporation whose stock is in the hands of the public. Subscribers to the junior securities, whose assistance is necessary to carry through the reorganization, must be given the hope of large profits in the future if they are to forego an immediate return. On the other hand, the capitalization of future earnings and any material disproportion between capitalization and assets of a company are two of the principal charges which have been made against railroad corporations in the past. The Third

Avenue plan has met with considerable opposition from the stockholders, some of whom claim that they are being too heavily assessed in the proposed reorganization. The decision of the commission on the whole scheme will undoubtedly have a bearing upon other reorganization plans in New York City, so that the outcome has an importance which it might not otherwise possess.

Supervision of Street Railways in England and Prussia

The forthcoming report of the Public Service Commission, First District, New York, will contain two interesting articles by Robert H. Whitten, one on the supervision of street railways in England, and the other on their supervision in Prussia. These articles are available through advance publication, with a foreword prepared by the commission. This introduction states "that to an American the striking feature of State supervision of street railways in England and Prussia is that it is devoted chiefly to the prevention rather than to the correction of abuses." It then explains that all construction plans of electric railway companies in the countries mentioned have to be approved, even down to the smallest details, before a line is built, and commends such supervision strongly. But it does not add that this fact, with the necessity of securing the approval to construct electric railway lines, not from one body, but in most cases from a number of local authorities, has been one important reason for the small amount of electric railway track built in Prussia and England since electricity came to be applied to railway service. Thus in the United Kingdom only 1400 miles of electric railway track were constructed between 1898 and 1908, and the roads under private ownership increased only 230 miles, although this decade witnessed the principal part of the electrification of the British roads. During the same period approximately 23,000 miles were added to the electric railway trackage of the United States. The figures for the 10-year period for Germany are not available, but according to recent statistics, the street railway mileage in Germany at present is 2345, of which only about 83 per cent is electric. Several single States in this country have a larger mileage than either Germany or the United Kingdom.

Opening of the Downtown Hudson Tunnels

On July 19 the two submarine tubes under the Hudson River connecting the new terminal station of the Hudson & Manhattan Railroad Company at Cortlandt and Church Streets on Manhattan Island with the Pennsylvania Railroad station in Jersey City will be opened for traffic. Two weeks later trains are to be run to the Erie station in Jersey City and the Lackawanna station in Hoboken, connecting there with the Morton Street tubes, which were opened in February of last year. The opening of the downtown river tunnels and the connecting land tunnel under Jersey City and Hoboken will mark the completion of the major part of the Hudson Tunnels system, leaving yet to be finished the Sixth Avenue extension north from Twenty-third Street to the Grand Central Station and one or two projected extensions in Jersey City. The enterprise is chiefly remarkable for the large investment of nearly \$70,000,000, subscribed entirely by private capitalists within the last eight years. The complete system of tunnels comprises only 9 miles of double track, but it reaches all but two of the steam railroad terminals on the New Jersey side

of the river, and eventually will connect with the two railroad stations in New York City. From the nature of its route, crossing twice under the river, the traffic will be largely short haul. While there will be the same congestion of travel during the morning and evening rush hours that takes place on all other rapid transit lines in and around New York, the constant incoming and outgoing stream of passengers to and from the steam railroad terminals will, no doubt, provide a well-balanced load during the non-rush hours. The plan of operation is to run trains on a regular headway, increasing or decreasing the number of cars per train according to the traffic.

The new terminal station of the downtown tunnels, which is described elsewhere in this issue, has been designed with the view of segregating inbound and outbound passengers and avoiding conflicting channels of movement, both between the trains and the concourse and the concourse and the street. The use of separate loading and unloading platforms, center and end door cars and the four loop tracks give the station a capacity in excess of that of the single pair of tubes under the river. With trains running at 1½-minute headway through the river tunnels, six minutes can be allowed for unloading and loading a train in the station. When the through service to Newark is begun and the Erie and Lackawanna commuter traffic must also be handled, the large capacity of the terminal station will probably be well taxed.

The Use of Condensers

How far is it justifiable to expend capital upon condensing plant in a power station? This is a problem that will rarely offer itself in respect of large stations with good load factors. In the case of small stations with small load factors the problem assumes a more intensive aspect. The justification for condensing to the power station man is one of a commercial order. In favor of it there is the direct economy of fuel and perhaps of feed water that has to be paid for: there is the increase of output from the rest of the plant—the engines and boilers—and this will vary in value according as the existing plant is or is not sufficient to deal with the present or prospective load with satisfaction. On the other side, there is the capital cost, which may be difficult to find, and there are the usual interest and other capital charges to be met annually. And there may be repairs. Labor may be saved in one part of the plant and expended in another part. The labor charges may be more or they may be less, according to whether existing labor is at present fully occupied or not, for one cannot reduce the firemen below one in number, though we may ease the duty on the one.

In considering the question of condensation the engineer will therefore take all points into consideration. If a condenser will effect an economy of 20 per cent in fuel it does not follow that this saving is always worth having. To save 20 per cent the plant must be large enough to do so when under full load. If the price of condensing plant varied exactly with its capacity and condensation were applied to a station with a load factor of 10 per cent and condensing plant cost \$5 per unit of capacity, what would it cost for this particular station? Obviously ten times \$5, or, in other words, the interest charge on the plant on the above assumption as to cost would amount to tenfold

what it would do for a steady load plant. So with depreciation and maintenance, all charges would be multiplied by the ratio of the cost of plants for 100 units and 10 units of power. A full scale plant may therefore cost so much as to be inadmissible. Can anything be done to modify it? All depends on the nature of the load. An electric railway load with occasional high peaks should certainly not be provided with a plant equal to dealing continuously with the maximum load. It may be but little in excess of the mean load. But it must not be so small that the rush of steam will cause a stoppage of the water flow in an injection condenser. With a surface condenser this does not occur. At most an overpressed condenser will yield a poor vacuum during the peak periods.

A load which has peaks of the more continuous order requires a larger condensing plant than the foregoing, but in all cases of low load factors it seems wise to moderate the expenditure on the plant so that while ample for the average load, it shall be only capable of giving a two-thirds or other selected vacuum on the peak loads. A distinct economy may thus be secured with an outlay that does not bear a very much greater ratio than one to what may be called steady load plant cost.

With a traction load it is not possible to vary the air pump speed so as to suit the load, for this changes so rapidly and frequently as to render this practically impossible. But with a lighting load it may be possible to vary the air pump speed over a wide range.

By such methods of design the range down to which a condenser may be applied with commercial economy will probably be extended considerably.

Violations of Rules on Interurban Railways

The recent deplorable head-on collision between two interurban cars in northern Indiana, in which 10 persons were killed and many others injured, affords a text for a timely preachment. The cause of the accident was disobedience of a positive meet order on the part of the crew of one car. All the evidence goes to show that the crews of both cars received and correctly repeated the meet order; that the orders were delivered 35 minutes before the collision occurred; that the crew of one car ran past the meeting point, stopped at a siding one-half mile beyond, then started out again and collided with the opposing car $1\frac{1}{2}$ miles beyond the meeting point while running at high speed. But one of three conclusions can be reached after a consideration of these facts; either that the crew at fault forgot their orders; that they lost their bearings on the road; or that they deliberately disobeyed the order and took a chance on getting farther along the road before meeting the opposing car. The reliability of the dispatching system, the condition of the track and rolling stock or the speed of the colliding cars were not in any degree contributing causes. This was distinctly and solely a "man failure."

Individuals will err, often through ignorance, and occasionally through wilfulness. These errors do not always cause accidents. Ninety-nine times out of a hundred nothing happens, but the hundredth time is fatal. The principle of rigid and unceasing discipline is to prevent not the one hundredth error, but, if possible, every one of the other ninety-nine. If a man makes a mistake, or takes a forbidden course once and is not dealt with summarily, the prob-

ability is that he will repeat the mistake or the disobedience. The punishment in every case requiring discipline should fit the crime, and the seriousness of the crime should be reckoned not so much by what actually happens as by what might have happened.

The standard of discipline on electric railways should be, if anything, higher than on steam railroads. The single-track, high-speed interurban electric roads operate at higher running speeds and with greater traffic density than most single-track steam roads. It may be argued that a single car is more easily controlled than a long train, and that electric schedules are more regular than the mixed freight, passenger and extra schedules of the steam roads. This is admitted, but it is also true that the motorman of an interurban car, knowing how quickly his car responds to the movement of the controller or brake handle, is tempted to take chances that a steam railroad engineer would not assume. Also, the very regularity of the electric schedules fosters slovenly observance of many rules, which in an emergency, when cars are not running on schedule time, are vital to safe operation.

Some interurban lines have made a point of employing only former steam-road employees as trainmen, believing that better results could be obtained with experienced railroad men than with men recruited from other occupations. Other things being equal, this expectation may be, and no doubt is, realized; but experienced railroad men not only know the rules, but also know when they can violate the rules without being detected. If the discipline maintained on the electric road is in any respect less rigid, and the consequences of a disobedient act even a trifle less severe than on the steam roads from which the men were drawn, only one result can be expected. Running an electric car on a regular schedule of short runs is an easy job for an ex-employee of a steam railroad. He is inclined to look on it as such and treat it with a lack of respect which is reflected in every move he makes. Nothing can counteract this feeling and its inevitable results except iron-handed discipline, dealing out punishment as severe as any ever encountered in the man's experience on the steam roads for which he formerly worked.

One difficulty in enforcing strict discipline which is recognized by all railway officers is the attitude assumed by the blameless member of a car crew in attempting to protect the guilty member, either by failing to report breaches of rules or corroborating a fictitious explanation. There is only one remedy for this. When one member of a crew is detected in violating a rule, and the violation must have been plain to the other member, discipline should be administered impartially to both if the blameless member makes no report of the occurrence.

Another difficulty, which in many cases, no doubt, prevents administering severe punishment of long suspension or discharge for gross violations of the rules, is the scarcity of men who are competent to run cars. If within a short period three or four motormen out of a total of 10 or 12 should be discharged for cause, their places could not be filled immediately from the extra men ordinarily employed by a small road. Even at the risk of crippling the service, however, it would be better to turn out a man deserving of discharge rather than overlook his disobedience and invite his contempt.

of the excavating shields as they were driven forward. The tubes are lined with concrete up to the level of the top of the cable ducts, but the top half is unlined. The diameter in the clear is 15 ft. 3 in. The land tunnels from the Pennsylvania station in Jersey City north to the junc-

The Erie station consists of a single island platform at the level of the tubes, with stairways leading up to a concourse above the tubes, on which are located the ticket offices. From this concourse stairways lead up to the street and the railroad station. There are also two electric elevators, having a capacity of 50 persons each, which carry passengers up and down from the level of the railroad station.

The station under the Pennsylvania Railroad terminal is 100 ft. below the level of the concourse of the railroad station, and provision has been made for carrying passengers up and down from both the street and the railroad station in hydraulic plunger elevators. Six of these elevators have been installed. Four elevators, with cars 10 ft. x 10 ft., holding 50 passengers, have a lift of 92 ft. 9 in., and rise to the railroad station concourse. Two elevators of similar size and capacity have a lift of 63 ft. 7 in., and carry passengers to the street entrances. The tunnels turn northward just beyond the Pennsylvania station, but the Newark extension tubes have been driven straight west for a short distance, and tracks have been laid in them. These short stub tracks will provide storage and switching space for the temporary shuttle service between Jersey City and New York pending the opening of the Jersey City tunnels north to Hoboken. They will be used for storage purposes only until the Newark extension is completed.

The two tubes under the river diverge after leaving the Pennsylvania station in Jersey City. The inbound tube runs up under Cortlandt Street, while the outbound tube runs under Fulton Street, two blocks north. The two tubes are connected on the New York end by the five loop tracks in the terminal station.

TERMINAL STATION

The new terminal station occupies three floors below



Hudson Terminal—View of Buildings from the River

tion with the first tunnels, which run to the Hoboken station of the Delaware, Lackawanna & Western, are also twin tubes lined with segmental cast-steel plates. The junction with the uptown tunnels south of the Lackawanna station is accomplished without grade crossings, so that there is no interference of traffic. There is only one station on this



Hudson Terminal—Concourse Level, Showing Stairways Leading to Train Platforms Below

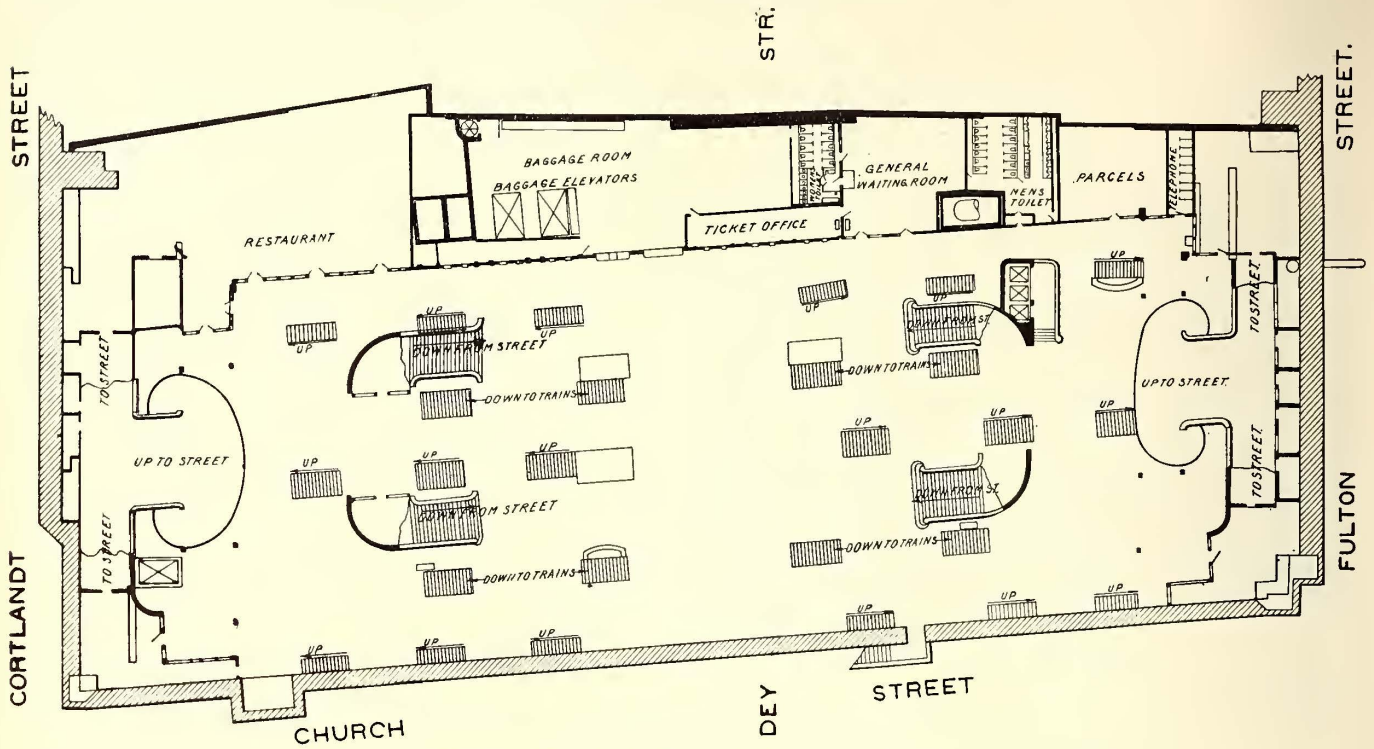
section, that under the Erie Railroad terminal. This station has exits and entrances from the street as well as from the concourse of the railroad station above. The station under the Pennsylvania Railroad terminal also has exits and entrances on the street and from the concourse of the station.

ground of the enormous Hudson Terminal Buildings, fronting on Church Street and extending from Fulton Street to Cortlandt Street. These twin buildings, which are separated by Dey Street, are the largest office buildings in the world. They have a frontage on Church Street of 400 ft., a depth

of 175 ft., and rise 22 stories above ground. They contain nearly 25 acres of floor space.

There are four main entrances and exits from the station concourse, which occupies the first level below the street. While the concourse was planned to have two main en-

trances of the two loading platforms on the track level. The exits from the concourse are broad curved inclines or ramps running up to the sidewalk on Cortlandt Street at one end and to Fulton Street at the other end. The stairways up from the unloading platforms on the track level direct

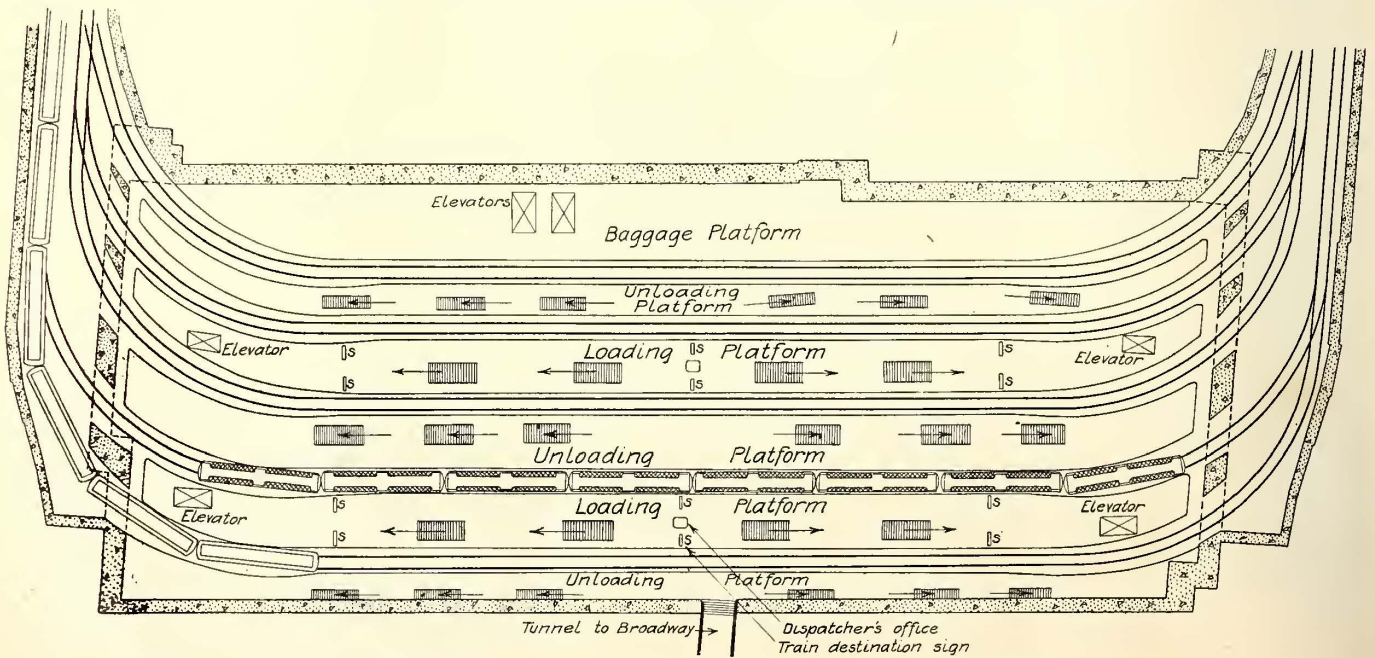


Hudson Terminal—Plan of Concourse Level

trances and two main exits, all four may be used by either incoming or outgoing passengers. The accompanying plan of the concourse floor shows the arrangement of entrances and exits, which is designed to segregate the incoming crowds from the outgoing crowds, so as to prevent as far as possible any confusion or counter movements. The en-

their streams of passengers toward these exit ramps without mingling or crossing the streams of incoming passengers who are about to take trains.

The loop tracks, five in number, occupy the level immediately below the concourse, and below this is still another level, on which are located the substation, ventilating ap-



Hudson Terminal—Plan of Track Level, Showing Position of Eight-Car Train

trances to the concourse are from both sidewalks on Deey Street. Wide corridors in both buildings lead to stairways running down to the concourse level. These stairways divide at the landing half way down, and discharge inbound passengers in two streams, each directed toward the en-

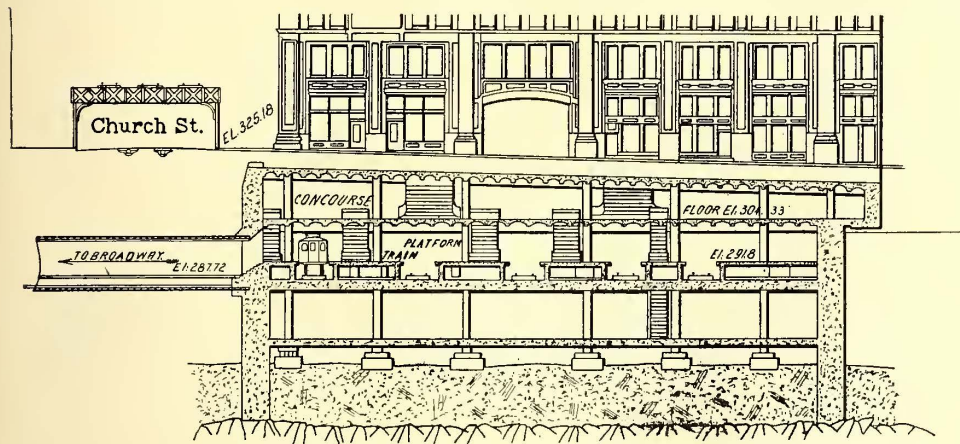
paratus, workroom, miscellaneous storage space and the engine and boiler rooms of the power station which supplies the utilities of the buildings.

CONCOURSE LEVEL

The public has free access to all parts of the concourse

floor. Much of the space on this floor is taken up by small shops and booths, in which almost every conceivable kind of merchandise will be sold. Included among the concessions for which space has already been rented are a meat market, drug store, trunk store, restaurant, etc. Both the Western Union and the Postal Telegraph companies have offices on the concourse and ample telephone service, with local switchboard operators, is to be provided in a convenient location next to the parcel room. The stands and

The westerly track will be used for baggage trains and supply trains carrying coal to the power station of the building and removing ashes. The passenger cars to be operated in the tunnels are built entirely of steel and all have end doors and center side doors. The platforms in the station have been arranged to completely segregate passengers boarding and alighting. A train coming into any one of the tracks in the station is inclosed by a loading platform on one side and an unloading platform on the other side. The three doors on each side of the cars permit unrestricted entrance from one platform and simultaneous exit to the other platform without creating any confusion or interference. Separate groups of stairways leading to each platform from the concourse above prevent any interference in the movement of passengers up or down.



Hudson Terminal—Cross Section at Dey Street

booths are of uniform and attractive design, harmonizing with the simple but handsome finish of the main aisles and walls. They occupy the space between the building columns and in the corners, leaving unobstructed broad aisles leading to all the entrances and exits and the stairways to the train platform level. The walls and columns of the concourse level are painted light cream color above a white tile wainscoting. The wainscoting is surmounted by a molding of dark green tile, ornamented with circular medallions of conventional flower design. The concourse is brilliantly lighted with rows of ceiling clusters of incandescent lamps inclosed in ground-glass bowls.

On the west side of the concourse floor will be a large restaurant, baggage room, ticket offices of the Pennsylvania, Lehigh Valley and Erie railroads, the terminals of which are reached by the tunnel trains, a general waiting room, with toilet rooms for men and women, and a parcel check room. The three steam railroads mentioned will sell through, commutation and local tickets. These three roads will also prepare their timetables for through and local trains so as to show arrival and departure from the tunnel station.

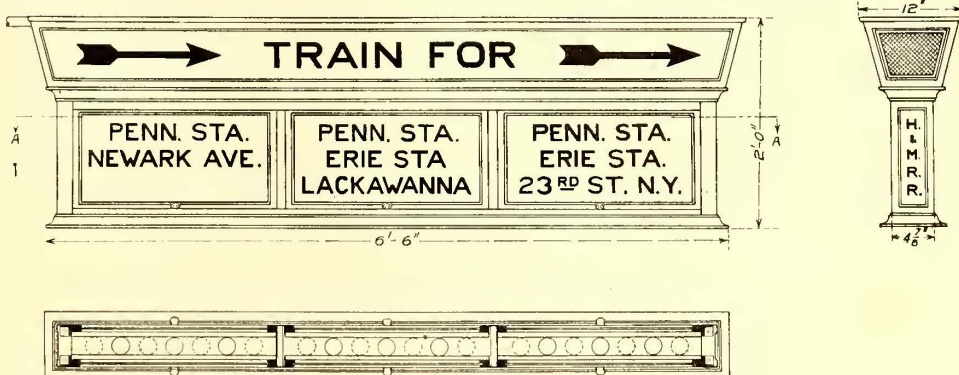
The women's toilet, rest parlor and check rooms will be most comfortable and elaborate, occupying together some 900 sq. ft. A large towel and a special cake of soap will be furnished to those who want them for 5 cents. Hairpins and other small toilet necessities will be provided gratis, and a maid will be in constant attendance. A long pier glass will also be one of the attractions of the waiting room. Except in the larger hotels of New York, no such conveniences for women have ever been provided.

TRAIN PLATFORMS

As will be seen from the plan of the track level, the station contains five tracks and six platforms. Only four of these tracks, however, will be used by passenger trains.

The station platforms are 370 ft. long, which permits the operation of eight-car trains. The entrance curves to the station loop tracks are of 90-ft. radius. The plan of the track level shows an eight-car train standing in the station. It will be seen that the length of straight track is sufficient to permit all of the cars to be entered or left without danger, from any one of the three doors on either side. The three platforms which serve tracks on each side are approximately 21 ft. wide. The two unloading platforms for the outside tracks, Nos. 1 and 4, are narrower in width. The supporting columns of the building rise through the platforms, but they are not symmetrically placed along the center lines. There is ample room, however, between the columns or the staircases and the edges of the platform to permit movement of passengers toward or away from the doors of the cars without jostling or crowding.

Four stairways lead down from the concourse to each of the two loading platforms and six stairways lead up from each of the unloading platforms. Ticket boxes are placed at the top of each of the stairways leading down to the



Hudson Terminal—Train Announcer Sign

loading platforms, so that passengers drop their tickets just before descending and boarding the trains. The ticket selling booths, 15 in number, are situated on the concourse floor, so as to be conveniently reached by passengers entering the station by any of the entrances or exits and before reaching the stairs to the loading platforms. The ticket booths are built of oak and, as will be seen in one of the illustrations, are triangular in shape, so as not to obstruct the entrances to the aisles leading to the stairways. A

number of portable ticket booths mounted on wheels will be used during rush hours.

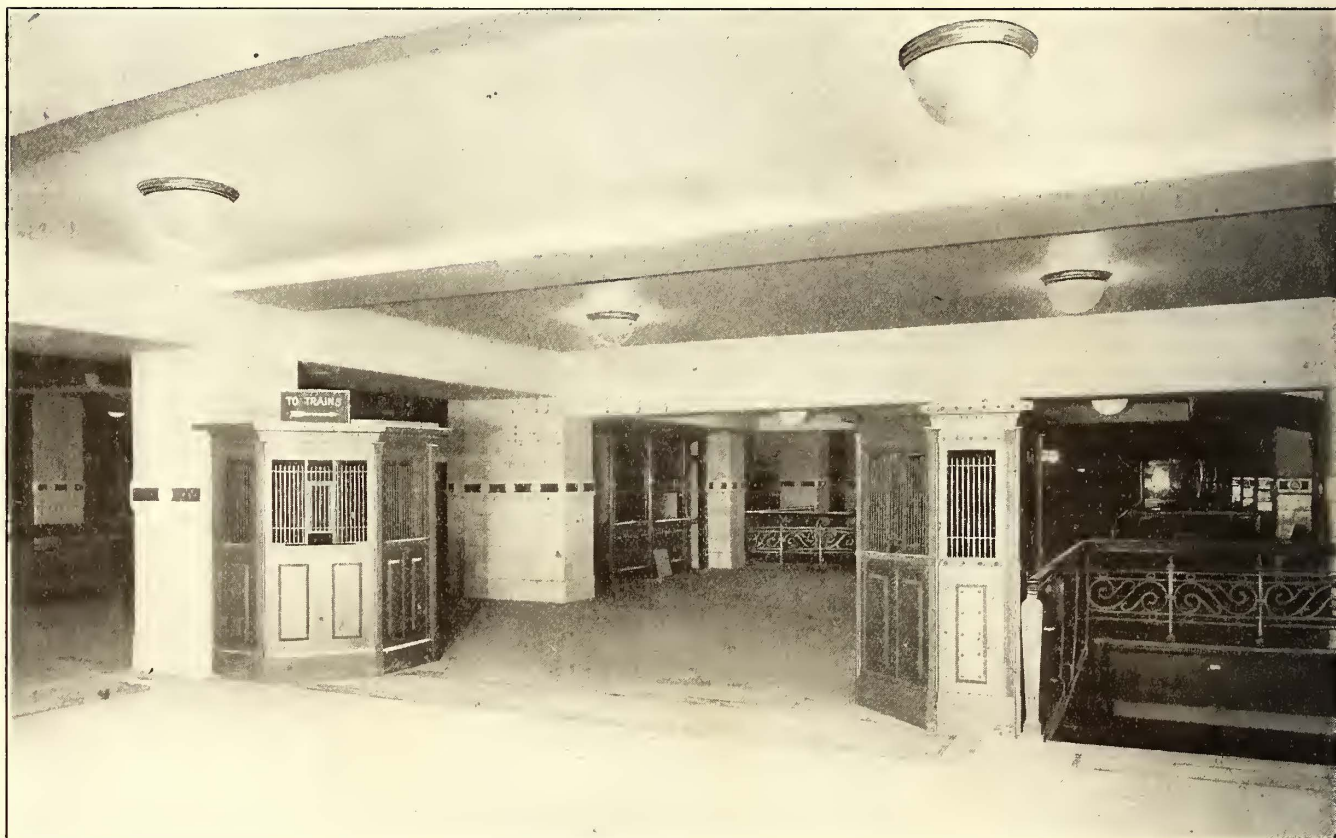
The train platforms are built of reinforced concrete with granolithic finish. The walls and columns on the platform level are covered with white glazed tiles from floor to ceiling. Frames for displaying advertising posters are formed by white tile moldings which harmonize with the plain white finish of the walls and will not accumulate dirt. These frames are built in on all four sides of the columns on the platforms, and at frequent intervals along the side walls.

LIGHTING

The platform level is lighted with five-lamp ceiling clusters inclosed in ground glass bowls. The edges of the platforms are also illuminated with rows of incandescent lamps. Most of the ceiling clusters are connected on the 240-volt, three-wire, direct-current light mains, which also supply the offices on the upper floors of the building. At

BAGGAGE HANDLING FACILITIES

Inasmuch as the new tunnels will make connections with the steam railroad stations on the New Jersey side, provision was made for handling baggage as well as passengers to and from the terminal station. A baggage receiving and delivery room has been built on the street level facing on Dey Street. From this receiving room two hydraulic plunger elevators run down to the basement level under the train platform level. It was the original intention to run a baggage car as the last car of each passenger train, and baggage elevators were installed at both ends of each of the two loading platforms. These elevators run down to the floor below, where trucking passages are provided, leading to the two main baggage elevators running up through the westerly platform to the receiving room on the street level. Since the station was completed a change has been decided upon in the method of handling baggage, as it was thought that an attempt to operate baggage cars as part



Hudson Terminal—Ticket-Selling Booths on Concourse Level

frequent intervals, however, a cluster of five incandescent lamps, forming part of the ceiling illumination, is connected to the third-rail power circuit. This insures against total darkness in the station in case the lighting circuits to which most of the ceiling clusters are connected should fail. The lamps on the edges of the platforms are also connected to the third-rail power circuit. No automatic switches have been installed to cut in outside sources of current in case the local supply should fail, but the switchboard in the substation in the basement of the building is connected through a hand-operated cut-out switch with the mains of the New York Edison Company. This makes available almost instantaneously an independent source of current. A large storage battery which floats on the building lighting circuits affords a supply of current for short periods without any interruption to the lights in case the rotaries in the substation or the generators in the power house should momentarily fail.

of the regular passenger trains would introduce chances for delay. The company is having built two special baggage cars, which will run as a separate train, loading and unloading only from the baggage platform on the west side of the station and making as many trips as are necessary during the day.

TRAIN ANNOUNCERS

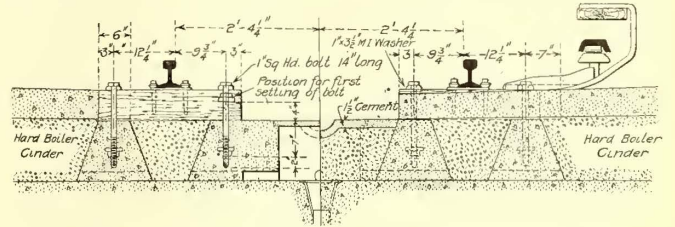
The initial service in the downtown tunnels will be only to the Pennsylvania railroad station in Jersey City and return, but after Aug. 2 trains will be run on three routes: To the Pennsylvania station and Newark Avenue, Jersey City; to the Pennsylvania, Erie and Lackawanna stations, and to the Pennsylvania and Erie stations in Jersey City, returning under the Morton Street tubes to Twenty-third Street and Sixth Avenue. To avoid confusion on the platforms, illuminated train announcer signs have been installed, six on each loading platform. The construction of

these signs is shown in one of the drawings. The sign consists of a narrow box, 6 ft. 6 in. long, 2 ft. high and 5 in. thick, supported transversely from the ceiling near the edge of the platform. Both sides of the box are formed of three panels of ground glass, behind which are sheet brass stencils showing the three routes for trains. Mounted between each pair of panels are six incandescent lamps connected in groups of three. The panels are surmounted by a sign with two arrows pointing toward the track and reading, "Train For." The lamp circuits are controlled either from the signal cabin on the baggage platform or the dispatcher's office. As a train enters the station a switch is closed illuminating the proper route panel in all three signs on the side of the loading platform from which the train departs. Similar signs actuated automatically on the approach of a train, through contacts alongside the track, are being installed at all stations on the Sixth Avenue extension.

TRACK CONSTRUCTION

The track construction in the station is shown by one of the drawings. The substructure under each rail consists of two truncated triangular prisms of concrete. The anchor bolts for holding the short pieces of ties on which the rails rest are embedded in the concrete as it is set. These bolts are 14 in. long and are threaded for a length of about 5 in. Before setting in the concrete the nut and washer on the lower end are screwed up on the threads about 3 in. and the head of the bolt is held in position a distance of

the bottom of the ties with hard boiler cinders. The space between the inside ends of the ties is then covered over with 1½ in. of cement. The space between ties under the rails and outside of the ends of the ties is filled in flush with the bottom flange of the rail with concrete laid on top of the boiler cinders. The rails are fastened to the short pieces of ties with tie plates held by two screw spikes. This construction provides a smooth, hard surface for the top



Hudson Terminal—Track Construction in Station

of the roadbed, which can be washed off at frequent intervals. A gutter is formed in the center of the track sloping to drains connected to the sewer to carry off water.

The third-rail is an inverted channel section weighing 75 lb. per yard, and is mounted on porcelain insulators supported by malleable iron brackets bolted to every seventh tie. It is protected by a 9-in. plank mounted above it.

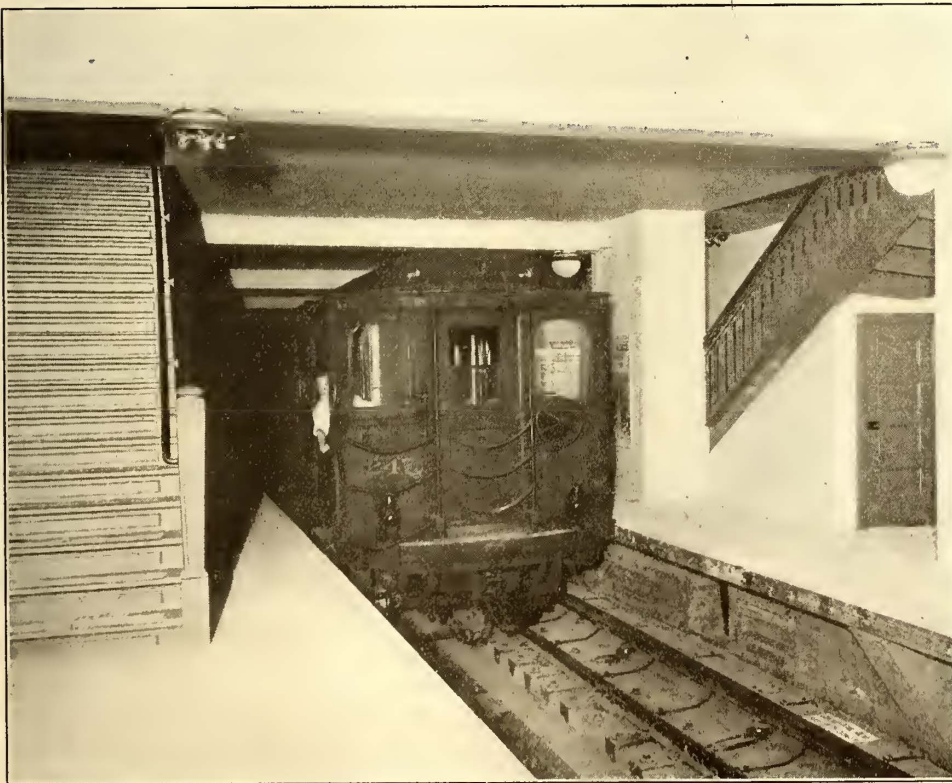
All special track work in the station is of Manard steel, furnished by the Pennsylvania Steel Company. The frogs are of solid construction and the switches are of the double-tongue type. Both tongues are connected to the switch-operating mechanism so that they work together.

VENTILATION OF STATION AND TUNNELS

Experience in the operation of the uptown tunnels of the Hudson & Manhattan system proved to the engineers that with trains running in separate tubes, which for the most part pass through soil saturated at all times with water, there was little difficulty in maintaining good natural ventilation in both the tunnels and the stations, and, furthermore, that the temperature of the air in the tunnels was uniformly cooler than that on the streets during warm weather. In designing the downtown tubes and terminal station, therefore, dependence was placed largely on natural ventilation. Fans have been provided in the station, however, to accelerate the movement of air if it is found

necessary, and suitable chambers have been provided in the land tunnels on the Jersey side, so that ventilating apparatus can be installed in that section if found necessary.

The ventilation of the concourse and track level of the terminal station is entirely independent of the general ventilating scheme installed in the building for the offices on the upper floors. An intake tunnel has been driven under the inbound train tunnel for some distance toward the river and suitable openings connecting the intake tunnel and the



Hudson Terminal—Train Standing in Station

about 2½ in. below the top of the ties while the concrete is allowed to set. When the concrete is set the bolts are turned out of the nuts embedded in the concrete and the short pieces of ties, from 28 in. to 32 in. long, are put in place on top of the two concrete prisms, with a spacing of 18 in. center to center. The anchor bolts are then screwed down tight in the nuts embedded in the concrete and the space below the ties between the two truncated prisms under each rail and between the rails is filled up level with

train tunnel have been provided. Air is drawn out of the inbound river tunnel through these openings and the intake tunnel by two fans located in the basement below the track level. These fans, which were furnished by the Massachusetts Fan Company, have a capacity each of 57,000 cu. ft. of air per minute. They are 160 in. in diameter and are driven by direct-connected motors. They exhaust the foul air drawn out of the tunnels into an uptake flue, which extends up to the level of the roof of the building. Adjoining this exhaust flue is a fresh-air flue, which also passes down to the basement level, and from which air is drawn for cooling the transformers and rotaries in the substation. No air is drawn from this flue directly into the terminal station. At the north end of two of the platforms of the station there have been installed motor-driven fans, each with a capacity of 15,000 cu. ft. of air per minute. These fans draw air out of the station and discharge it

lamps and locking circuits in the four interlocking machines.

The automatic block signals have been located so that trains running on a two-minute headway at the normal operating speeds in the different parts of the tunnel will always have a clear distant signal ahead of them. The automatic stops are connected on the two-block overlap system; that is, two block sections always separate one train from another. At the entrances to the stations the overlaps have been considerably shortened so as to reduce the delay in running into the stations to the minimum. The block signals consist of two circular iron casings mounted one above the other on the tunnel wall. The upper case or home signal shows on red and one green lens, behind each of which are two incandescent lamps connected in multiple across the lighting mains. The lower case or distant signal shows two similar lenses of yellow and green glass, behind each of which are mounted two lamps. The



Hudson Terminal—Station Under Erie Railroad Terminal in Jersey City

through suitable passages into the outbound tunnel some distance beyond the station. With the aid of these four fans it is believed that the piston action of the trains in the two tubes will be ample to maintain a satisfactory circulation of air in both levels of the station.

SIGNALS

The installation of the interlocking switches and automatic block signals in the new tunnels was made by the Union Switch & Signal Company. Interlocking machines have been installed at the terminal station, the Jersey City station, and at the junction with the uptown river tunnels south of the Hoboken station. Between the limits of the interlockings both tracks have been equipped with automatic home and distant block signals and automatic stops. The distinguishing feature of the entire signal installation is the use of alternating current throughout, both for the track circuits and for the operation of all signal relays, signal

lamps burn continuously behind one of the two lenses in each case. Current is shifted from one pair of lamps to the other when the signal changes from stop to clear or caution to clear by auxiliary relays controlled by the track circuit relays. No slides or shutters are employed, and in this respect the signals differ from those installed in the uptown tunnels, which employ only one set of lamps and have a moving shutter which passes between the lamps and the lenses, blanking one lens to display the other.

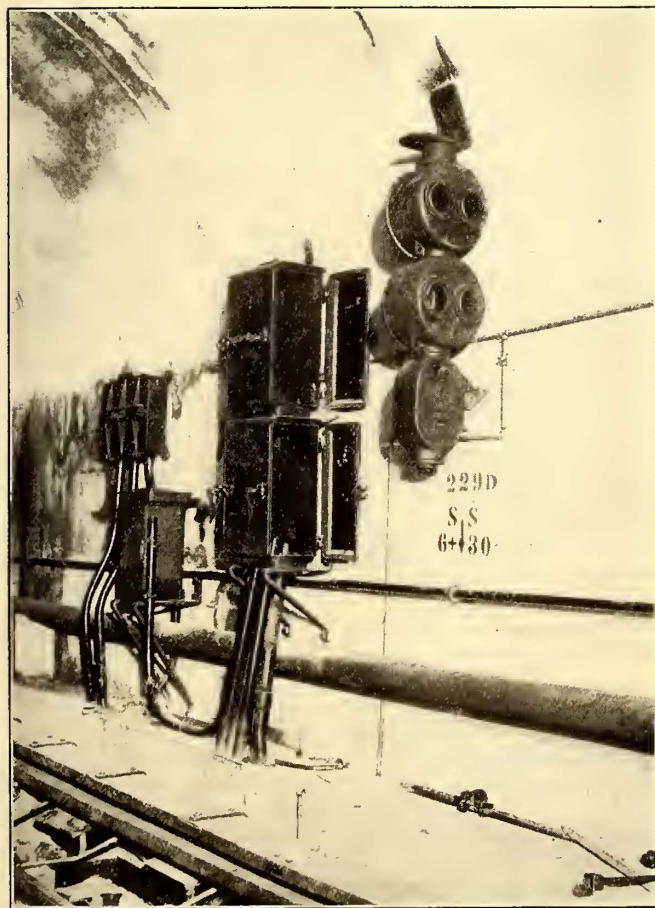
Double-rail, alternating-current track circuits are employed with inductance bonds at each cut-section. This is substantially the same system of track circuits as that installed by the Union Switch & Signal Company on the West Jersey & Sea Shore Railroad.

A compressed air supply pipe is carried through the tunnels to operate the automatic stops, which are of the electro-pneumatic type, substantially the same as those used

in the Interborough subway. The only difference is in the use of alternating-current magnets on the control valves.

The interlocking plant at the terminal station consists of a 23-lever standard electro-pneumatic machine mounted near the center of the baggage platform, on the west side of the station. This machine has eight levers which control eight switches and two derails, six levers controlling 14 signals, four levers for check locking between the terminal station and the Jersey City station and five spare levers. The interlocking signals are of the same type as the automatic block signals, and the switch-operating mechanisms are of the standard electro-pneumatic type, with alternating-current magnet valves. No detector bars are used on the switches, the switches being locked up in the machine by track circuit locking.

The principal signals in the station are the starting signals mounted on the north end of each of the platforms.



Hudson Terminal—Automatic Block Signals in River Tunnels

Similar signals are mounted on the south ends of the platforms for emergency use in case it is necessary to reverse the direction of traffic in the tunnels. These emergency starting signals are connected with repcating signals which are mounted in plain view of the motormen at the platforms. The remaining signals are the route signals at the entrances to the station loop tracks from the inbound main track.

The signal tower which contains the interlocking machine is located in such a position that the operator cannot see all of the trains in the station. This difficulty is overcome by the use of an illuminated track diagram mounted above the interlocking machine and showing by lights whether any section of the station tracks is occupied or unoccupied. The diagram consists of a ground glass plate,

on which the tracks are marked, and behind it are groups of small incandescent lamps. These lamps burn when the tracks are unoccupied and are extinguished behind each section of the tracks shown on the diagram which is occupied by a train. The illumination of the diagram is controlled through relays inserted in the track circuits within the station limits. The illuminated diagram not only includes the station tracks, but also includes both of the river tunnels as far as the Jersey City station, and the movement of a train from the time it leaves Jersey City is continuously indicated in the diagram. Track circuits within the limits of the interlocking cover the entire length of each track and use only a single rail circuit instead of both rails, as in the automatic block sections.

At the Jersey City station a 17-lever electro-pneumatic machine controls the movements of trains through the junction to the Hoboken extension tunnel and the Newark Avenue tunnels. As already mentioned, the Newark Avenue extension tunnels have been constructed for a short distance to provide storage and switching tracks, and the interlocking machine has been installed at this point to handle the temporary shuttle service. When the tunnels to Hoboken are opened this machine will not be required under normal operating conditions.

Provision has been made for reverse movement of trains between the terminal station and the Jersey City station by the introduction of check locking between the two machines at each end of the tunnel. This, in effect, creates a single block section between the terminal station and the Jersey City station, which can be occupied by only one train at a time.

At the junction of the Jersey City tunnels with the Hoboken tunnels the tubes are at two different levels and two separate 11-lever machines have been installed, one for each track. Both of these machines, however, are mounted in a signal tower at the level of the north-bound track. Illuminated track diagrams have been provided in connection with both machines, and it is believed that there will be no difficulty in manipulating the machines, even though the operator cannot see the approaching trains on the south-bound track.

Current for the operation of the signals and interlocking plants is taken from 1100-volt mains leading from the power house in Jersey City. Small transformers are installed at each signal to step down this current to 55 volts, 25 cycles. Twenty-five-cycle current at a low voltage is used for the track circuits.

SUBSTATION

In the basement of the building, below the train platform level, a large substation has been constructed which will convert the high-tension alternating current from the power house in Jersey City into 600-volt direct current for the third-rail circuits on the New York side, and also will supply 240-volt, direct current for all lighting and power circuits in the Terminal Buildings. This substation occupies a space 87 ft. x 59 ft., and is entirely enclosed from the surrounding space on the lower level by heavy fire walls. It contains at the present time two 1500-kw G. E. rotary converters for the railway load and four 750-kw G. E. rotaries for the lighting and power load in the building and station. Foundations have been provided for two additional 1500-kw units, giving the station a total ultimate capacity of 9000 kw. Each of the railway units has a separate set of three 750-kw, air-cooled transformers, taking 11,000-volt, 25-cycle current from the transmission line leading through the river tunnels from the Jersey City power

house and delivering 390 volts on the secondaries. The rotaries deliver direct current at 625 volts to the third-rail feeders. The four lighting and power units supply all the lights in the buildings, as well as the elevator motors, electric pumps and ventilating fan motors. Each unit has three air-cooled transformers delivering current at 178 volts, which is converted into direct current at 240 volts. A three-wire distribution system is used throughout the building, giving 120 volts across the lamps. Potential regulators are attached to the circuits of each of the lighting and power rotaries.

The switchboard is on the operating floor at the north end of the room, and the oil switches on the high-tension line are mounted on a gallery above. Overhead crane runways divide the station longitudinally into two bays, each served by a hand-operated traveling crane. The station is lighted by Cooper Hewitt mercury vapor lamps suspended from the ceiling. Cooling air for the transformers is supplied by motor-driven fans, taking cool air from a fresh-air intake flue running down from the roof level of the building.

TRAIN SERVICE

The initial service in the downtown tunnels will be a regular 3-minute headway during the day and early evening. Five-car trains will be run during hours of light traffic, and during rush hours the number of cars per train will be increased to eight.

The traffic to be handled is very large. Careful studies indicate that the ferries to New Jersey carry 128 million passengers each year. It is estimated that the tunnels should carry at least 60 per cent of this traffic, or 77 million passengers, based on present travel. Allowing for the natural growth of traffic with improved facilities, the number of passengers which will be carried under the river within a few years will probably increase to 100,000,000 per annum. This traffic, of course, will be divided between the uptown and downtown tunnels. The maximum capacity of the tunnel system is estimated to be 220,000,000 passengers per year when eight-car trains are operated on 1½-minute headway.

The Pennsylvania Railroad has announced that all tickets to and from New York over its lines will be honored for passage through the tunnels to the terminal station only on and after July 19, the date of opening the tunnels. The ferry service from Jersey City to Cortlandt Street, Desbrosses Street and Twenty-third Street will be continued, and passengers will have the option of using either the boats or the tunnels. All tickets, whether commutation, local, excursion or through interline, will be honored at the terminal station for passage to Jersey City. In the opposite direction, tunnel coupons will be attached to all one-way and excursion tickets to New York from Philadelphia and points east of Philadelphia, which will be collected at the entrance to the elevators in the Jersey City station, where commutation tickets will also be punched. Passengers on through trains from the south and west will be supplied with tunnel tickets on application to the train conductor before arrival at Jersey City. For the present, baggage will not be handled through the tunnels. For each of the through trains leaving from Jersey City a special connecting tunnel train will leave the terminal station 5 minutes after the leaving time of the Cortlandt Street ferry and 10 minutes after the Twenty-third Street boat. The running time of trains to the Pennsylvania station in Jersey City will be 3 minutes, to the Erie station 6 minutes and to the Delaware, Lackawanna & Western station in Hoboken 10 minutes.

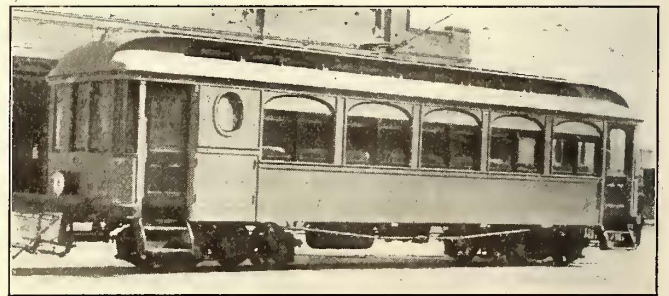
The men who have been conspicuous in the promotion of the Hudson Tunnel System are: Walter G. Oakman, president of the construction company, known as the Hudson Companies; William G. McAdoo, president of the Hudson & Manhattan Railroad Company, and Pliny Fisk and William N. Barnum, of the banking house of Harvey Fisk & Sons. The civil engineering features of the tunnels and the design of the stations have been worked out by Charles H. Jacobs, chief engineer, and J. Vipond Davies, deputy chief engineer, who have had direct supervision over the construction forces. During a part of the time since the work began as many as 6000 men have been employed. The design and installation of the power house in Jersey City, substations, third-rail, feeders and miscellaneous electrical equipment and also the rolling stock were in charge of L. B. Stillwell, consulting engineer, and Hugh Hazelton, electrical engineer.

The cost of the system when fully completed will be about \$70,000,000.

FUNERAL CAR OF THE LOS ANGELES RAILWAY COMPANY

The Los Angeles Railway Company recently placed in service a funeral car designed and built in its own shops. The car body is placed on one of its standard double trucks, which are arranged for the narrow gage of 3.5 ft. It contains a compartment for the casket placed at right angles to the length of the car. This compartment is equipped with rollers similar to those of the usual hearse, and is provided with doors at either side of the car. A passageway opens from this compartment into the passenger compartment, from which the casket with its covering of flowers can be viewed. The passenger compartment, which is designed to seat 24 persons on wickerware chairs, can be subdivided at any desired point by means of heavy curtains to separate the immediate relatives from the other mourners.

Although no attempt has been made at drapery, the interior of the car has a neat chapel appearance, as the arched



Funeral Car of Los Angeles Railway Company

windows and ventilators are built of stained glass, and appropriate colors are used for the silk curtains. The exterior of the car has been given a gray color with gold trimmings, thus proclaiming the mission of the car in a modest way.

The car is equipped with two 50-hp Westinghouse motors, for the operation of which there is an isolated motor-man's cab at either platform. When in service, the car is completely enclosed from front to rear, without any exposed platform or passenger step. It was designed by E. L. Stephens, master car builder of the Los Angeles Railway Company, and built under his direction in the company's shops.

INVESTIGATING THE CAUSE OF BREAKAGE OF HIGH-TENSION GLASS INSULATORS*

A few years ago an electric railway company in the Central States built a 30,000-volt transmission line about as shown in the accompanying sketch. Sections A-B-C-F were six wires, the balance three wires. The poles were spaced about 100 ft., and, allowing for double-armed poles, there were approximately 31,000 high-potential insulators on the 112 miles of transmission line. The 10-mile section B-C was first constructed, and in this section about 4000 glass insulators were used, of a type which will be designated as "A." Contracts for the balance of the line were let later, and for the remaining 102 miles approximately 27,000 glass insulators of a type "B" were bought. The two insulators were of somewhat different designs, but about the same size and weight:

	Insulator "A"	Insulator "B"
Outside diameter.....	7 in.	7½ in.
Total arcing distance, tie wire to pin.....	6⅝ in.	6 15/16 in.
Total surface leakage distance, tie wire to pin.....	11⅜ in.	10¼ in.
Distance on surface, tie wire to edge of skirt.....	4 in.	3¾ in.
Arcing distance, edge of skirt to pin	2⅝ in.	3 11/16 in.
Surface leakage distance, edge of skirt to pin.....	7⅜ in.	7 in.
Weight.....	4 lb. 12 oz.	4 lb. 8 oz.

Manufacturer "A" refused to make any electrical guarantees whatever. Manufacturer "B" guaranteed his insulators to withstand certain electrical tests, such as the salt water puncture test at 60,000 volts, a test between a wire tied to the neck of the insulator in the usual manner and the leadfoil-covered surface of the pin upon which the insulator was mounted at 90,000 volts, etc.

Insulator "B" was finally chosen for the 102 miles remaining to be constructed, for the following reasons: Willingness of manufacturer to make electrical guarantees; similarity in size and weight of the two insulators,

The transmission line having been built and operation started with a line voltage of approximately 30,000, the "B" type insulators began to break down. From the first accurate records were kept, showing in each case of breakdown the date, hour, length of time during which operation was interrupted, weather and temperature conditions, etc. Although there was no absolute uniformity, the breakages occurred most frequently in rainy weather. The following statement shows the total number of failures, by months, during the period in which the "B" type insulators were in service:

October (half month)...	28	August.....	18
November.....	33	September.....	28
December.....	24	October.....	16
January.....	66	November.....	59
February.....	60	December.....	102
March.....	63	January.....	51
April.....	5	February.....	40
May.....	6	March (nine days).....	9
June.....	24		
July.....	17	Total.....	649

This list includes only the "B" type insulators, of which the total number in service was about 27,000. During this period but one "A" type insulator failed in the same service, of a total of 4000 in use.

About 100 miles of electric railway was dependent upon this transmission line for power. Four of the six substations contained regulating storage batteries which were capable of carrying the ordinary total load on those substations for 20 to 30 minutes. Failure of power supply for even five minutes was sufficient to interfere with schedules, while a failure lasting 20 minutes or more meant their complete demoralization. If the defective insulator was in sections A-B-C-F, where the transmission line was in duplicate, it was sometimes possible to operate all substations through the remaining one of the parallel transmission lines. Often, however, both circuits would be affected; in this case, or if the trouble was in one of the other sections with but a single transmission line, all substations beyond the defective section were without power until the defective insulator was located and replaced.

The company repeatedly called upon the manufacturer to replace the "B" type insulators. At first this was met by a policy of delay, the manufacturer holding that a few defective insulators were to be expected in so large a lot. Later, he refused to replace the insulators, and the company, declining to pay for them, replaced them with "A" type insulators. Since that time the operation of the transmission line has been entirely satisfactory, and the number of insulator breakages has been normally low—a total of about 20 out of some 31,000 insulators in service for four years.

Following the traction company's refusal to pay for the "B" type insulators the manufacturer sued for payment. His claim was that a certain type of insulator had been specified and that type furnished, also that such tests as were specified in the contract had been made and successfully met. These claims the traction company did not deny, but raised the point that the guaranty as to workmanship and material had not been met, in that the insulators had been improperly, imperfectly or unevenly annealed. The effect of poor annealing was shown to decrease the specific resistance of glass, thus allowing more leakage current to pass through to the pin and abnormally heat the insulator; also to set up uneven and abnormal stresses in the glass, thus rendering it less able to withstand the mechanical strains due to expansion and contraction. This argument

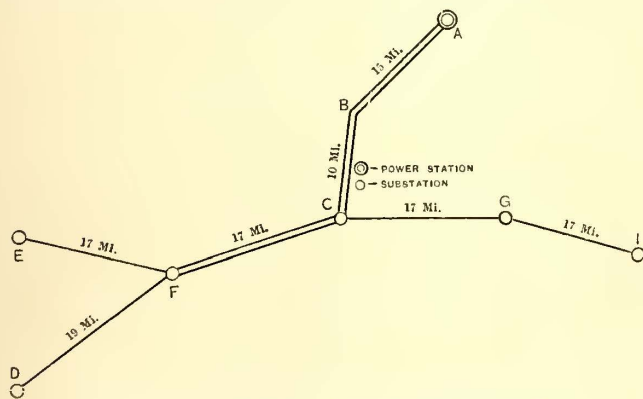


Diagram of High-Tension Transmission Line

"B" having the advantage as to greater arcing distance, which was considered important; and a much lower bid price on the "B" type insulator. The contract for 27,000 insulators furnished by manufacturer "B" specified the type and design of the insulator by its catalog or trade designation, and also specified that each insulator furnished should be capable of withstanding the electrical tests before mentioned. The contractor guaranteed the fulfilment of these specifications, and also that, "except where otherwise specified, material shall be of the first quality, and workmanship of the best."

*Abstract of paper by Albert S. Richey, E. E., and Frederick Bonnet, Jr., Ph. D., read before the Worcester Polytechnic Institute chapter of the Sigma Xi Society.

was strengthened by these facts: That insulators broke after current was applied to the line; that more insulators broke during rainy than during dry weather, and that the "A" type insulators on the same transmission line suffered practically no breakage during the time that the "B" type was breaking constantly.

Tests by polarized light proved type "B," although of the same chemical composition, was subjected to stresses caused by improper annealing, while in type "A" there was an almost entire absence of stresses. In carrying out the tests each insulator was so mounted that when it was rotated about its pin axis the same thickness of glass skirt was always presented between the polarizer and the analyzer, which previously had been arranged so as to allow no light to pass. Stresses in the insulator were indicated by the varying intensity of light and by color changes. The insulators showing stresses had been poorly annealed. Under service conditions they became heated on account of conductive leakage and were destroyed.

The polarized-light method is valuable in detecting poor insulators, although the tests can be considered as only qualitative.

COMBINATION LIMITED TROLLEY AND BOAT SERVICE

The Evansville (Ind.) Railways Company has recently installed a limited service in connection with a fast motor boat line serving towns on the Ohio River, both above and below Rockport, the eastern terminus of the interurban route. Two limiteds make the run each way daily from Evansville to Rockport, 31 miles, in one hour and four minutes. Local trains on hourly headway make the same run in 1 hour and 20 minutes. The boat service is operated between Rockport and Cannelton, 25 miles up the river, and Rockport and Owensboro, Ky., 10 miles down the river. Each limited connects with a boat for Owens-

the river south of Evansville and extends parallel with the river to Owensboro. The one-way steam fare is \$1.50, while the electric fare is 85 cents. The round-trip steam fare is \$3 and the electric round-trip fare is \$1.45. The running time of the steam trains is 1 hour and 45 minutes, and of electric trains in combination with the boat service 1 hour and 55 minutes. This paper is indebted to W. H. Carson, general manager of the Evansville Railways, for the above information regarding this interesting combination of boat and trolley service.

PUBLICITY CAMPAIGN IN BIRMINGHAM

For the last two years the Birmingham Railway, Light & Power Company has been publishing a number of articles in the daily papers of that city in connection with a vigorous publicity campaign which it has been conducting. The service supplied by the company is lighting and power as well as railway, so that the announcements referred to both its lighting and railway interests, but most of them discussed matters relating to the railway service, as that is the one in which the relations of the company with the public are most intimate.

One of the announcements early this year was entitled "Some Facts About the Lighting Business." The point was made that if a man buys an automobile he figures that it will not last over two or three years, and improvements in manufacture are so constant that existing machines are relegated in a few years to the scrap pile. The company explains that this condition also holds true with a lighting plant, and states that with the exception of one small machine and a single boiler there are no machines in its power plant that were in operation in 1901. Since that time the company has installed 19,000 hp of boilers, with a corresponding equipment of generating apparatus, and has expended \$1,696,000 in the equipment. Nevertheless, the rate for current has been reduced from 16 cents per kw-hour in 1905 to 12 cents for lighting and 7 cents for power. At the same time the company has improved its rolling stock, and its latest cars cost \$8,200 each.

Another advertisement calls attention to the increase in taxes and licenses paid during the past years, and is as follows:

AN INCREASE OF 486.31 PER CENT IN OUR TAXES AND LICENSES IN 6 YEARS. Will any other business firm or corporation in the State of Alabama show such an enormous increase in taxes and licenses as ours, 486.31 per cent in six years?

And in that time our earnings have only increased about 100 per cent, so that our taxes and license charges are increasing at a ratio almost five times as rapidly as our earnings.

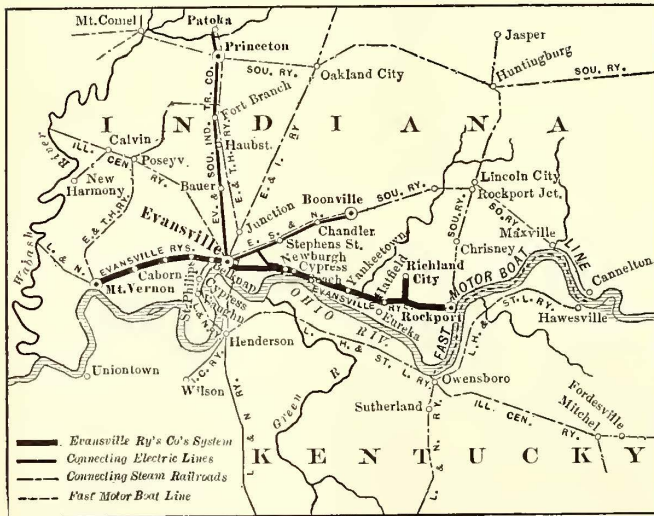
In 1903 we paid \$26,525 for State, county and city taxes, and licenses, and in 1908 we are paying \$155,519.53, an increase of \$128,994.53 in six years, or 486.31 per cent. The following table will show the amount of taxes and licenses paid each year, the amount of increase and percentage of increase over the preceding year:

Year.	Amount taxes, etc.	Amount increase over preceding year.	Per cent increase over preceding year.
1903.....	\$26,525	.....	...
1904.....	35,879	\$9,354	35.3
1905.....	42,311	6,432	17.9
1906.....	66,480	24,169	57.1
1907.....	127,911	61,431	92.4
1908.....	155,519	27,608	21.6
Total increase 6 years.....	\$128,994	% inc. 6 yrs. 486.31	

Thus it will be seen that taxes, licenses, etc., have grown out of all proportion to the growth of our business or the enhancement of our property value. Weigh these figures carefully and think of what a drain an increase of 486.31 per cent in taxes would be on your business in six years.

The statement above shows that we are doing more than our share toward paying the expenses of the State, city and county.

Another calls attention to the greater luxury and higher speed furnished by the modern cars, and cites the increased cost of living expenses, with the exception of lighting and transportation. The figures on the cost of foodstuffs and



Map of Evansville Railways Company System

boro. The Cannelton boat connections, with one exception, are local trains. The success of this service has been due largely to its regularity. The fast passenger motor boat which connects with the interurban trains is 90 ft. long and has a capacity for 150 passengers. The interior of the boat is attractively finished in leather, and it is driven by a 75-hp gasoline engine. The railway company has improved the wharf at Rockport so that the transfer from trolley to boat and vice versa is made without discomfort.

This combination interurban and boat service is in competition with local service on a steam line which crosses

the general expenses of living are quoted from the United States Bureau of Labor. This bulletin follows:

COST OF LIVING CONSTANTLY INCREASING; PUBLIC SERVICE IS CHEAPER.

Every housekeeper, every head of a family, every merchant, every man or woman who buys food, fuel or clothing knows that the cost of living has increased rapidly in the past 10 or 12 years, and is constantly increasing.

While that portion of your necessary living is growing more expensive, public service has been getting less and less costly all these years. By public service we mean gas, electricity and street car service. Our statement can be easily confirmed by turning to any records, or by exercising the memory a little. And while this service is being furnished to you cheaper, labor, fuel, raw materials, finished products and everything else that is used in the manufacture of gas and electricity and furnishing car service has become more expensive. More modern methods, better management and increased business enable us to reduce the cost of public service to you.

For instance, as late as July, 1905, electric current for lighting was 16 cents per kilowatt. Now it is 12 cents, a reduction in four years of 25 per cent.

At one time gas cost \$2.65 per thousand cubic feet. In 1901 gas in Birmingham cost the consumer \$1.65 per thousand. On the consolidation of this company it was reduced to \$1.35 per thousand, and about a year later the cost was still further reduced to \$1.10 per thousand, a reduction of 33 1/2 per cent in less than eight years.

To-day the passenger on the street car rides farther for 5 cents than he did in 1901, and, in addition, receives a transfer which materially increases the earning power of his nickel. The following table shows the average fare per passenger earned by this company since 1902, showing that travel has grown constantly less expensive to the patron of the cars:

Year.	Earnings per passenger.
1902.....	.0520
1903.....	.0480
1904.....	.0480
1905.....	.0450
1906.....	.0440
1907.....	.0418
1908.....	.0412

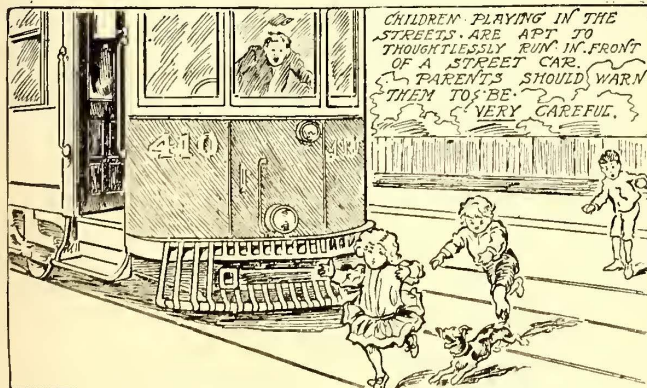
Since 1901 the amount received per passenger has decreased from .0520 cent to .0412 cent, a falling off of .0108 cent, which is a reduction of 20 per cent in the cost per ride to passengers. Transfers over all lines and the rapidly increasing use of transfers are responsible for the reduction.

On the other hand, foodstuffs and the general cost of living have advanced, as the following figures from the bulletins of the United States Bureau of Labor show:

Article.	How sold.	1904.	1907.
Dried apples.....	per pound	.1250	.1417
Dry beans.....	per quart	.1250	.1396
Rib roasts.....	per pound	.1750	.2104
Chuck steak.....	per pound	.1000	.1250
Round steak.....	per pound	.1500	.1667
Sirloin.....	per pound	.1788	.2050
Bread.....	per loaf	.0500	.0500
Bread.....	per pound	.0667	.0667
Canned beef.....	per pound	.1250	.1250
Butter.....	per pound	.3500	.3792
Chicken.....	per pound	.1925	.1933
Coffee.....	per pound	.2500	.2500
Meal.....	per pound	.0177	.0222
Flour.....	one-eighth barrel	.8458	.9125
Leaf lard.....	per pound	.1250	.1500
Leg mutton.....	per pound	.1700	.2167
Pork chops.....	per pound	.1563	.1813
Salt pork.....	per pound	.1250	.1425
Potatoes.....	per peck	.3136	.3375

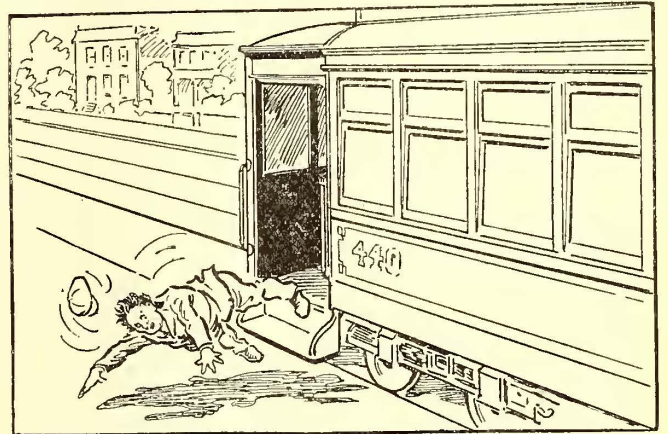
To summarize our statements, you, as our customer or street car patron, are getting more service for less money and you are getting better service for less money, in nearly all cases, and in others you are getting better service for the same money, which is equivalent to the same service for less money.

In still another bulletin there is a graphical representation of the distance which a passenger can travel on the



Poster Illustrating Accidents to Children

campaign to reduce accidents it had applied automotoneers to the controllers to get rid of the sudden jerks often claimed in damage suits. It had placed guards on all bumpers to prevent people standing on them. It had published articles dealing with the most common kinds of accidents, and had warned the public against them. It had placed cards on the



Poster Illustrating Accident to Person Alighting from Car

cars, illustrating the right way and the wrong way of getting off the cars, and the management had frequently had earnest talks with the motormen and conductors, individually and in meetings, urging them to be careful. Finally, it had installed gates on all loop cars. The notice in regard to these gates is contained in the announcement following, which was illustrated by views of the platform, showing the gates closed and open.

GATES ON STREET CARS.

Commencing to-day we will inaugurate a new system for the prevention of platform accidents.

On all loop cars, commencing this morning, will be found wire gates which will be opened and closed by the motorman to allow passengers to get on and off the cars. There are gates on both the front and rear end of the cars, and the motorman closes the gates by a lever before he starts the car. This prevents any one from getting on the car after it has started. When the car is stopped, the motorman opens the gates with the same lever. When the gates are closed no one can get off the car.

We have studied this system as applied elsewhere and find that it secures excellent results in preventing platform accidents. We are installing it on all our cars as fast as they can be sent to the shops.

There is a double reason for trying to reduce accidents; the greatest being our desire to prevent suffering in all forms as caused by street car accidents, and in this effort the public should join us heartily, and the other reason is to reduce our annual expense caused by damage suits and claims growing out of accidents.

Before passing judgment on the gates, see how they operate, study the humanitarian question involved and bring the matter of accidents home to your own family. If the use of gates prevents accidents, we are mutually benefited and should be satisfied.

Two of the bulletins which illustrate two forms of accidents are also reproduced.

Another series of announcements related to the question of transfers. One was entitled "Two Uses of Transfers," and read as follows:

TWO USES OF TRANSFERS.

There are two ways to use a transfer—the right and the wrong. We believe that fully nine-tenths of our patrons use transfers as they are intended to be used. The other one-tenth are abusing the privilege and violating the law.

Transfers are a convenience granted the public in order that they may use two different car lines for the price of a single fare, or which makes it possible to make a continuous journey although using more than one line. When persons accept a transfer they bind themselves to use that transfer themselves and not to give it to some one else. Only one person is entitled to use the transfer, the person who paid the cash fare. Only one person is entitled to give you a transfer—the conductor.

The courts have held that any person giving or receiving a transfer is violating the law. At first the use of the transfer was nominal, but it has grown wonderfully in the past two years, until to-day it seriously affects our revenue. Seventeen per cent of the passengers we carry use transfers; therefore it will be seen that the abuse of the privilege is a serious loss to us.

We only want to be treated by the public as the public would have us treat them. We are trying to do what is right and just on all occasions. Give us the same treatment that we give you.

If you are entitled to a transfer, we urge you to use one. We want you to have one. But if some one offers you one, you do wrong to accept it, just as the person who tenders it does wrong.

After all, it is merely another instance of applying the Golden Rule. Think of this if you have unconsciously been a member of the one-tenth who abuse the privilege.

Another cited the number of passengers carried on transfers since the year 1902, and showed that during the pre-

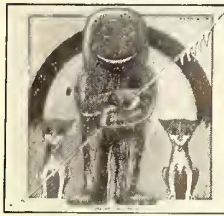
lines of the company in 1909 for a single fare as compared with that possible 10 or 20 years ago.

The bulletins, however, have not all been devoted to financial matters. Several of them discuss the subject of accidents. One told what the company was doing to prevent accidents. It explained that every modern device has been applied, with the result that the company has practically eliminated certain kinds of accidents. In its cam-

vious years the number who had used transfers amounted in fares to \$1,160,480.15, and the average was \$193.413.36, or \$537.26 per day.

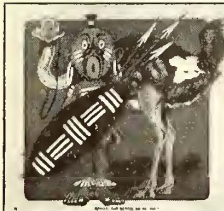
CARD POSTERS OF THE OLD COLONY RAILWAY

The accompanying illustrations show two very striking posters of a series advertising the special car service of the Old Colony Street Railway, Boston. Others described the feelings which Hoofitalot, the Hottentot, and Patago-



Old Blubberbalow, the fat Esquimaux.
From the land of the midnight sun,
Hitched up his dogs and sped far away
To the south on a trip, just for fun.
His aboriginal mind was wise of its kind,
Quick to tumble to new fangled ways.
He found it was jolly—the SPECIAL CAR trolley—
And now talks himself dumb in its praise.

ORDER A SPECIAL CAR AT THE NEAREST OFFICE OF THE
Old Colony Street Railway Co.



For roaming the wilds of his native land,
Bent on forage, business, or pleasure.
Chief Kluggamagali, the gay cannibal
Thought his ostrich the traveller's treasure.
But that was before his trip to this shore
Where he changed this quite silly notion,
For SPECIAL CAR rides, he quickly decides
Most delightful of all locomotion.

ORDER A SPECIAL CAR AT THE NEAREST OFFICE OF THE
Old Colony Street Railway Co.

Advertisements of Special Car Service

nian Pete would have experienced had they been able to have patronized these cars. These posters, and others, were used in the racks in the center of the cars last season, and, according to H. A. Faulkner, passenger agent, undoubtedly brought in considerable business.

STATISTICS OF ELECTRIC RAILWAYS IN INDIANA

The accompanying table has been compiled from statistics contained in the annual report of the Indiana Railroad Commission for 1908. It gives various figures relating to traffic and unit earnings and expenses. Some of the

A NEW METHOD OF PRESERVING WOODEN POLES

In a paper read before the Association of Railway Telegraph Superintendents in Detroit, June 26, H. P. Folsom, of the Universal Pole & Post Preserving Company, Circleville, Ohio, described a new method of preserving wooden poles and posts from decay at the ground line. The unique feature of this method is in surrounding the base of the poles with a fiber cylinder which incloses a mixture of powerful germicides packed around the pole above and below the ground line.

In applying this method of preservation to poles which have begun to decay, a hole is dug around the pole to a depth of 14 in. below the ground line. All decayed wood is removed from the surface of the pole, and the bottom of the hole is then covered with a thin layer of Portland cement mixed with sand. A cylindrical jacket of "hydrobestos" about 4 in. larger in diameter than the butt of the pole is then put in place in the hole and the lower edge of the jacket is embedded in the cement. The two edges of the jacket are lapped over about 2 in. and fastened with a specially prepared cement. The hydrobestos jacket is made in the form of a sheet composed of a special mixture of asbestos and asphaltum. This mixture is subjected to a pressure of about 27,000 lb. per square inch during manufacture, and it is claimed that it is practically indestructible, being impervious to water, acids or alkali.

When the jacket is put in place around the pole the intervening space is filled with a germicide mixture, packed in dry. In selecting the germicide the aim was to use a mixture which was powerful and effective in destroying animal organisms, and which would not injure the fiber of the wood or be too costly to be practicable. The mixture ordinarily used consists of hydrated lime, rock salt (chloride of sodium) and a small quantity of sulphate of copper, mixed with coarse sand. After the germicide is in place in the shell or jacket, a reinforced cap or collar made of Portland cement and sand is formed around the pole on top of the jacket. For the reinforcement, one or more turns of the old telegraph or telephone wire are used. The reinforced cap protects the chemicals and the jacket

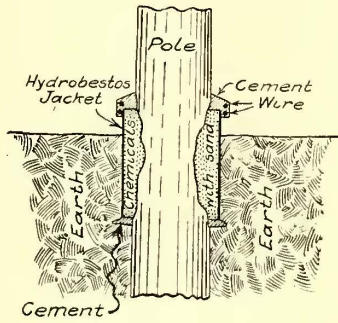
ELECTRIC RAILWAYS OF INDIANA—REVENUE AND TRAFFIC STATISTICS, ENTIRE LINE

NAMES OF ROADS	Gross Earnings Per Passenger	Platform Expenses Per Passenger	Other Car Service Expenses Per Passenger	Cost of Power Per Passenger	Other Expenses Per Passenger	Total Revenue Passengers Carried	Total Car Mileage	Maintenance Way and Structures Per Car Mile	Maintenance of Equipment Per Car Mile	Platform Expenses Per Car Mile	Other Car Service Expenses Per Car Mile	Cost of Power Per Car Mile	General Expenses Per Car Mile
Angola Railway & Power Co.	\$0 12.500					38,251							
Cincinnati, Lawrenceberg & Aurora Electric Street Railway	09.734	\$0 01.047	\$0 00.312	\$0 01.318	\$0 01.139		564,005	\$0 03.253	\$0 01.951	\$0 02.571	\$0 00.767	\$0 03.186	\$0 02.798
Chicago, South Bend & Northern Indiana Ry.	06.122	01.143	00.346	01.196	01.490	9 068,691	2,438,102	00.721	02.548	04.245	01.287	04.445	02.112
Evansville & Mt. Vernon Electric Railway	22.300	01.160	02.150	04.700	08.600								
Evansville & Southern Indiana Traction Co.	05.530	02.550	00.270	00.600	01.410	6,584,563	1,803,485	01.060	02.080	04.060	01.380	02.300	01.680
Evansville & Eastern Electric Railway		03.800	02.400	05.000	00.600	202 436							
Ft. Wayne & Wabash Valley Traction Co.	07.600	01.300	00.600	00.900	01.800	13,878,752	3,416,117	01.300	01.700	03.500	01.500	02.600	02.100
French Lick & West Baden Railroad	05.000			01.490	03.480								
Indiana Union Traction Co.	12.420	01.270	00.840	01.420	03.640	12,693,625	6,695,538	02.210	01.970	03.020	02.010	03.040	03.950
Indianapolis, Columbus & Southern Trac. Co.	21.368	01.706					900,386	03.257	01.649				
Indianapolis, Crawfordsville & Western Tr. Co.	24.210						557,195						
Indianapolis & Cincinnati Traction Co.	27.640	02.310	02 110	03.230	09.360	1,371,568		02.450	02.030	02.040	01.870	02.690	03.960
Indianapolis & Louisville Traction Co.	20.083	02.315	02.372	04.207	07.967	258,699	417,662	00.793	01.271	01.434	01.486	02.606	02.851
Kokomo, Marion & Western Traction Co.	09.700					1,555,605							
Lebanon & Thorntown Traction Co.	14.414	02.489	01.600	02.201	01.130	98,991	73,526	00.949	00.998	03.351	01.155	03.172	00.559
Louisville & Northern Railway & Lighting Co.	06.850	00.770	00.510		00.060	1,801,274	761,885	00.080	00.820	01.880	01.260		01.830
Louisville & Southern Indiana Traction Co.	04.800	00.840	00.220	00.830	00.190	4,992,895	1,118,631	00.390	00.930	04.260	01.100	04.190	00.970
Marion, Bluffton & Eastern Traction Co.	17.731	01.507	00.284	04.119	04.258	482,060	375,219	01.618	00.382	02.028	01.787	05.543	02.330
Muncie & Portland Traction Co.	17.770	01.290	00.850	03.340	04.060			01.020	00.790	01.980	01.300	05.280	04.440
Ohio Electric Railway						21,296,203	9,899,427						
Terre Haute, Indianapolis & Eastern Trac. Co.	10.780	01.340	00.700	01.490	02.790	18,553,757	7,581,770	01.340	01.780	03.280	01.740	03.600	03.730
Winona Interurban Railway	23.400	02.400	01.590	05.000	01.070	318,054	369,267	01.480	01.710	02.100	01.370	03.400	02.790

companies in the State did not make reports to the commission containing uniform information, so that the records are not complete in each case. The effect of the interurban business on the average revenue per passenger carried is shown by the relatively large amount given in most of the companies, indicating that long distance travel is being rapidly developed.

from the action of rain and snow, and also protects the pole against damage from grass fires. The chemicals enclosed by the jacket are slowly dissolved by the natural moisture in the pole, and they pass into the cell structure of the wood by capillary attraction. This continuous absorption, it is claimed, destroys all fungi which may be in the pole at the time the preservative is applied, and the

jacket and cap prevent the lodging of other germs in the wood near the ground line. The reinforced cement cap gives a finished appearance to the pole, and experience has proved that there is little or no tendency for the concrete to crack or disintegrate, as there is no expansion or contraction in the pole which it surrounds. When applying this method of preservation to a small number of poles the men work in gangs of three. One man precedes the other two and digs around and cleans the poles. The other two men follow with a wagon containing the chemicals, and finish the treatment. If the poles are located along a railroad the material can be distributed in small sacks at each pole from a hand car.



Method of Applying Preservative

Three men can treat from 20 to 30 25-ft. poles per day. The cost per pole for labor and material is from 75 cents to \$1. Some very large poles cost \$1.50 to \$2.50. A few poles were treated by this method nine years ago, and it is stated that the protecting sleeve is still in good condition.

ADVERTISING BASEBALL AT FORT SMITH, ARK.

The Fort Smith Light & Traction Company, of Fort Smith, Ark., has adopted an unusual method of advertising games held at the home baseball park during the summer. A panel sign is placed on either side of an ordinary car, which is run over all the lines up to 4 o'clock on the



Advertisement on Car

days when games are played. These signs can be attached to any car which is not operating on schedule time, and if all passenger cars are in service it can be placed on a construction car.

A curious error appeared in the New York *World* in a statement regarding the annual convention of the Street Railway Association of the State of New York. It said that at the meeting C. S. Sims, of the Delaware & Hudson Railroad, declared that a large number of electric railway motormen are now habitual users of cocaine, and are taking the drug in the form of snuff. The only speech which Mr. Sims made at the convention was at the banquet, when he responded to a toast, and the subject of cocaine was not mentioned in any way by him.

RECENT REGISTER PATENTS

Considerable interest has been excited by the issue on May 25, 1909, of two patents on register mechanism to Leo Ehrlich, of St. Louis, Mo., and assigned to the American Register Company, of St. Louis. These patents are numbered 922,867 and 922,868, and as the application for the first patent was filed Dec. 10, 1894, and that for the second patent Dec. 23, 1895, they have been dormant in the patent office for over 14 years and 13 years, respectively.

Patent No. 922,867 is for a machine which will register two or more classes of fares with separate totalizers, both registers being operated from the same lever, and a shifter being employed to connect the operating mechanism with one or the other register. The text describes two forms of double registers, one with a dial and two pointers, the other with two sets of numbered wheel registers. The patent has 92 claims, three of which are as follows:

(1) In a fare register the combination with the dial of the trip register of a plurality of pointers co-operating therewith to indicate different classes of fares, a single actuating device for said pointers and combined actuating and shifting or setting means operated by a single uniform movement to cause said device to actuate either pointer at will and register the corresponding class of fare.

(17) In a fare register the combination, with a multiple trip register for separately registering fares of different classes received during a trip, of a plurality of permanent registers for permanently registering fares of different classes, a fare indicator for indicating fares of different classes, and means for actuating by a single movement either desired number of the trip register and the corresponding permanent register and moving the fare indicator to indicate such class of fare.

(84) In a fare register the combination with a multiple trip register employing a plurality of registering devices, indicating different classes of fares, of a corresponding plurality of permanent registers, and means for actuating any one of the registering devices, together with its corresponding permanent register by a single movement, such movement being the same in degree for each class of fare and without previous adjustment.

Patent 922,868 describes a method of operating a double register by a rock shaft operated in one direction to register one class of fare and in the opposite direction to register another class of fare; also a method of attaching the register to the wall of the car by means of a plate with posts which fit into corresponding sockets on the register, the posts being fitted with flanged heads and, if desired, with locking screws.

The patent specifies that the rock shaft can be operated by one set of operating handles or by two sets, extending along opposite sides of the car. This patent has 50 claims, of which two are as follows:

(1) In a fare register the combination with the trip register wheel of a shaft permanently in gear therewith, a permanent register, a clutch member for connecting and disconnecting the shaft and permanent register, resetting means for the trip register, and means for shifting the clutch at each resetting of the trip register, to disconnect the permanent register from the trip register and permit the resetting of the latter.

(40) The combination with a fare register of an attaching plate adapted to be permanently secured to the wall of the car and provided with a series of integral posts having flanged heads co-operating with holes in the back plate of the register, and means co-operating with one of said posts for binding or clamping the register in position upon all of the posts, with the flanged heads of the latter engaging the back plate of the register and preventing its removal.

It is understood that these two patents have been acquired by the Ohmer Fare Register Company, of Dayton, Ohio.

EXHIBIT ARRANGEMENTS AT DENVER

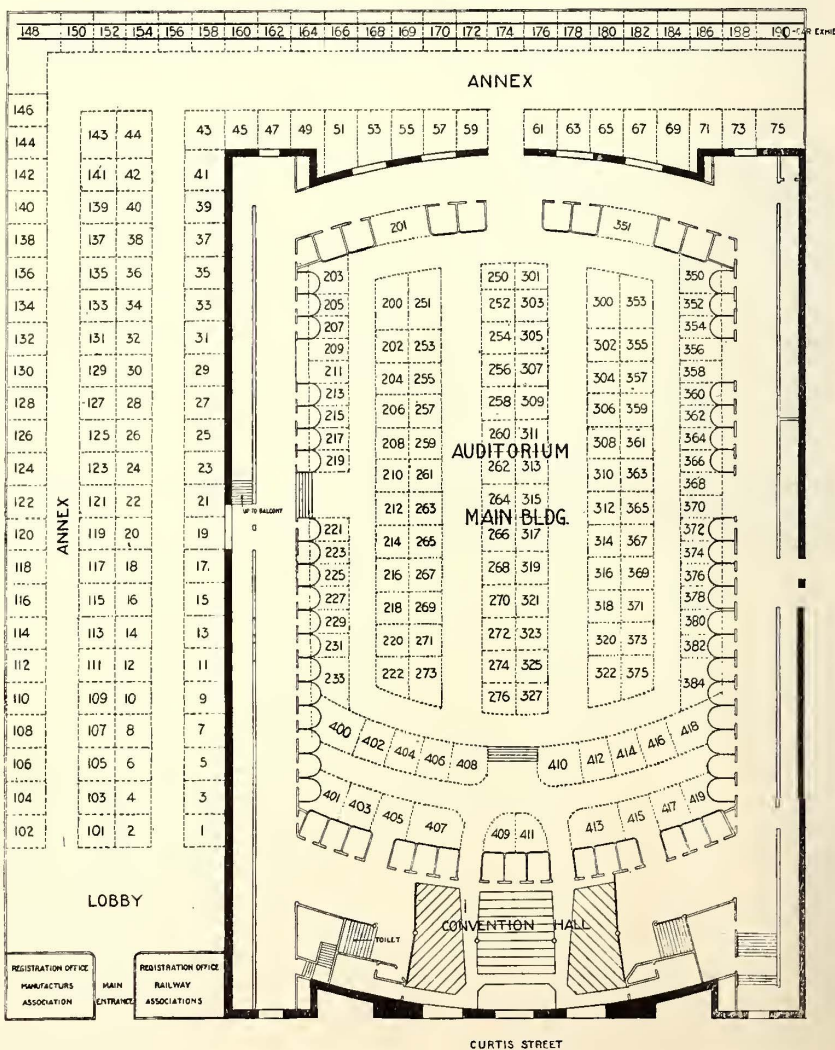
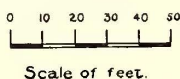
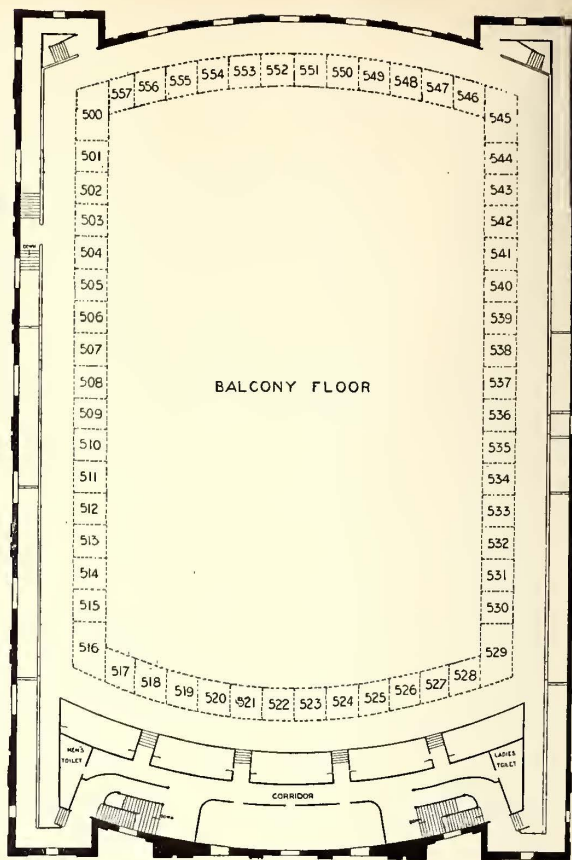
An announcement was printed in the issue of this paper for July 3 in regard to the exhibits at the Denver convention, and last week a view was published of the Auditorium in which these exhibits are to be shown. The accompanying diagram shows the plan of the Auditorium, as approved July 11 by the executive committee of the American Street & Interurban Railway Manufacturers' Association. As will be seen, the space available for exhibit purposes consists of the ground floor and balcony of the Auditorium and the areas on two sides of the Auditorium marked "Annex" in the diagram. This area consists of portions of Fourteenth Street and Champa Street, which will be boarded over and provided with a roof. The main entrance to the hall will be at the corner of Fourteenth Street and Curtis Street, with the registration office of the railway associations on the right, that of the Manufacturers' Association on the left and the headquarters of the ELECTRIC RAILWAY JOURNAL just inside the entrance.

At a meeting of the executive committee of the Manufacturers' Association, held July 11, an average rate of 30 cents per square foot of space was decided upon for exhibitors. The exhibit committee of the Manufacturers' Association is now preparing blank applications for space, and these blanks will be sent out in the course of the next few days. It is very important that all intending exhibitors should forward their applications to the committee as quickly as possible. A date will be fixed for applications for space. This date will appear on the blank, and all applications received on or before that date will be treated alike. Applications received after that date will be treated on the principle of first come, first served.

The exhibits are in charge of Kenneth D. Hequembourg, vice-president in charge of exhibits, and general sales agent, Walker-Bennett Manufacturing Company, West Twenty-ninth Street, New York. The other members of the exhibit committee are: C. M. Atwood, Sherwin-Williams Company, Denver; R. M. Babbitt, ELECTRIC RAILWAY JOURNAL, Chicago; L. M. Cargo, Westinghouse Company, Denver; G. W. Cox, Electric Service Supplies Company, Keokuk, Ia.; Arthur T. Herr, American Brake Shoe & Foundry Company, Denver; H. J. Kenfield, *Electric Traction Weekly*, Chicago; Charles Knight, American Steel & Wire Company, Chicago; H. G. McConaughy, Dearborn Drug & Chemical Company, New York; S. P. McGough, The Lorain Steel Company, Chicago; C. J. Olmstead, Westinghouse Traction Brake Company, Chicago; R. H. Thompson, The J. G. Brill Company, Denver; A. L. Wilkinson, Ohio Brass Company, Mansfield, Ohio.

The committee has issued the following circular in regard to exhibits:

The Denver Auditorium, with temporary buildings in Fourteenth Street and Champa Street, will provide about 35,000 sq. ft. of exhibit space, exclusive of aisles, on the main floor level with street,



Plan of Exhibit Space in Auditorium Building

and about 6000 sq. ft. in the balcony of the Auditorium, one flight up. Additional space can be secured on Champa Street if necessary by extending the temporary building.

The temporary buildings, called Annex, will be constructed of heavy canvas with board floor and suitable floor covering to match the color scheme, similar to Annex or Building No. 3 at 1908 convention on Million Dollar Steel Pier.

The exhibit committee is working with the railroads to secure a one-half rate from Chicago and St. Louis, or other Missouri River points. A meeting with the freight officials has been held, the result of which enables us to predict that we shall secure this concession. We have also under consideration from a Chicago forwarding and warehouse concern a proposition to consolidate all L.C.L. shipments at Chicago and Newark, N. J., wherein they claim they can save us between Chicago and Denver on

	Per cwt.
Electrical appliances, machinery and supplies . . .	98c.
Class "A" machinery, from	98c. to \$2.
Railway equipment and supplies	10c.
Street car material, Division B	18c. to 98c.

A proportionate saving on all consolidation L.C.L. shipments will result from consolidation at Newark, N. J. If we are successful in securing what is desired to make a large exhibit, the freight charge to Denver from Chicago, or other "Missouri River points," and return, including consolidation charges for L.C.L. shipments, will range from 97c. to \$1.17 per cwt.

A much lower charge for carting shipments to the exhibit space has been secured in Denver than we have enjoyed at recent conventions.

The charges for furniture and other details will be about the same as last year.

The charge for exhibit space is 30c. a square foot, and includes practically everything enjoyed at the 1908 convention at Atlantic City.

The plan above shows the admirable layout secured, and with a large number of new hotels available, coupled with the enthusiasm shown by the railway officials and manufacturers in the Central, Western and Southern States, it is expected that a very large attendance will result.

Application blanks and detail circulars will be mailed as soon as arrangements have been completed.

EXHIBIT COMMITTEE,
(Signed) KENNETH D. HEQUEMBOURG,
Vice-President.

The Manufacturers' Association has just issued a 22-page pamphlet giving considerable information of interest to members of the association and those who are thinking of joining the association. It includes a history of the association, a list of the conventions at which the association has had charge of the exhibits, and all past and present officers of the association. The constitution and by-laws, a list of the members and a printed copy of the report of the treasurer is appended. This report shows the balance on hand Dec. 11, 1908, \$6,851. Copies of this pamphlet are being distributed by Secretary Keegan.

The Pennsylvania Railroad is planning to set out more than 1,000,000 trees. This will make a total of 3,430,000 trees planted in the last three years to provide for some of the company's future requirements in timber and cross-ties. This constitutes the largest forestry plan yet undertaken by any private corporation. Heretofore the company's forestry operations have been confined to a limited area between Philadelphia and Altoona. This year, however, 65,000 trees are being set out on tracts of land near Mctuchen and New Brunswick, N. J. In addition, there are to be planted within the next month 207,000 trees near Concwago, Pa., 186,000 in the vicinity of Van Dyke, 334,000 at Lewistown Junction, 7000 at Pomeroy and 205,000 at Denholm.

SPECIAL TRAINS FROM NEW YORK AND BOSTON TO THE DENVER CONVENTION

Since the announcement in the last issue of this paper of the appointment of the transportation committees to take charge of special trains to the Denver convention, the following plans for special trains from New York and Boston have been announced:

SPECIAL TRAINS FROM NEW YORK

It has now been decided to run at least two special trains from New York City, one over the New York Central Railroad and the other over the Pennsylvania Railroad. The New York Central train will run as a second section of the Twentieth Century Limited, and will leave New York at 3:30 p. m. on Thursday, Sept. 30. It will arrive in Denver at 4 p. m. on Saturday. If a sufficient number of applications are received for a second train over the New York Central lines, the second train will leave New York at 3:30 p. m. on Friday, Oct. 1, and will arrive in Denver at 4 p. m. on Sunday. The special train over the Pennsylvania Railroad will leave New York at 4 p. m. on Friday, arriving at Denver at 4:40 p. m. on Sunday. If there are sufficient applications, a second train will be run over the Pennsylvania Railroad at a time to be announced later. Both trains will be run via Chicago, but the routes, after leaving Chicago, have not yet been definitely determined.

Both trains will be made up in the same way. Each will consist of one baggage car, one buffet car, one observation car, one dining car and Pullman compartment and drawing room sleeping cars. The fare to be charged will be \$60 from New York to Denver and return. Tickets can be purchased for this same amount to Pueblo and Colorado Springs, so that if any delegates are planning to visit either of the latter places while in Colorado, they should purchase their tickets to include these cities. The Pullman fares on each train will be: Berth \$11, section \$22, drawing room \$39, stateroom in a compartment car \$31. These charges are for one way only. An arrangement has been made with the railroad companies to make the following charges for meals served in the dining cars: Breakfast 75 cents, luncheon \$1, dinner \$1.25.

Those desiring accommodations on the New York Central train should apply to J. H. Pardee, who can be addressed in care of the American Street & Interurban Railway Association, 29 West Thirty-ninth Street, New York. Those who wish to travel on the Pennsylvania train should apply to W. L. Conwell, at the same address.

No attempt will be made by either of these committees to organize a special train for the return trip, as it is thought that some delegates will desire to return promptly, while others will undoubtedly wish to spend some time in Colorado, or else go farther West. The return tickets, however, are available on any of the trains on either line and by any route of the initial line. That is, the passenger by the New York Central train which goes via Chicago will be permitted to return via St. Louis if he so desires. The same privilege is allowed the passengers on the Pennsylvania train.

SPECIAL TRAIN FROM BOSTON

In addition to the New York trains, a special train will be run from Boston, under the auspices of the Massachusetts Street Railway Association. This train will be unique, because after the convention it will go to the Pacific Coast and visit Seattle, San Francisco and Los Angeles and other Coast cities. The exact route has not yet been determined, but will be announced later by Charles S. Clark, secretary,

Massachusetts Street Railway Association, who has charge of the train. While in the far Northwest the passengers on this train will have an opportunity to inspect the Stone & Webster properties at Seattle, Tacoma, Everett and Bellingham by invitation of Messrs. Stone & Webster. They will also be able to visit the Alaska-Yukon-Pacific Exhibition.

Soon after the date of the Denver convention had been changed to that which has now been selected, Mr. Clark received the following cordial letter from Messrs. Stone & Webster, and it was largely on account of this invitation, which, it is understood, includes all attendants at the convention, that the train was organized:

STONE & WEBSTER,
147 Milk St., Boston,
Boston, Mass., July 12, 1909.

CHARLES S. CLARK, ESQ., Secretary,
Massachusetts Street Railway Association,
70 Kilby St., Boston, Mass.

DEAR SIR:

We understand that the effort to change the date of the American Street and Interurban Railway Association Convention at Denver to one enough earlier to make it possible for such of the members as desires, after the convention, to go to the Pacific Coast and visit the Alaska-Yukon-Pacific Fair, which is now being held in Seattle, was successful, and in your opinion many of the delegates to the convention will be glad to avail of the opportunity to visit the Puget Sound country. As is generally known, the street railway and interurban companies, including electric and gas lighting companies at Seattle, Tacoma, Everett and Bellingham, Washington, are managed by the Stone & Webster Management Association for the owners, and illustrate, to a marked degree, the operation of public utilities companies in fast growing cities and towns in that country.

We should be glad to have you extend to such of the delegates as wish to go to the Puget Sound district a cordial invitation, and we will do our best to properly entertain those who make the journey. We believe they will be interested in the country and what it has to show.

Very truly yours,
STONE & WEBSTER.

(Signed)

This opportunity, together with the very favorable rates for the round trip from Boston to Seattle and return will undoubtedly induce a great many to make this trip, especially those who have never visited the Pacific Coast. Mr. Clark announces that the railroad fare by this special train from Boston and return via Denver, Seattle, and through California, will not exceed \$115, and it is expected that by chartering Pullman cars by the day that the meals and Pullman accommodations for the four weeks' trip, including the Denver convention, will not exceed a like amount.

The Boston train will consist of a combination baggage and buffet parlor smoking car (with bathroom and barber shop), a dining car, standard sleeping cars, a compartment car, and a compartment car with observation end. It will be lighted by electricity, and at all points visited will be side-tracked for occupancy by those persons who desire to make use of it. The party will have the exclusive use of all portions of the train from Boston until they return to Boston. This will avoid the annoyance of transfer from the train to a hotel at the various points visited. While en route members of the party will have access to their baggage at any time, as it will be in charge of a special baggage master.

The following route has been tentatively settled upon: At the close of the convention the train will leave Denver, passing through Colorado Springs, Pueblo, Canon City, the Royal Gorge of the Arkansas, and stopping at Glenwood Springs. A part of a day will be spent at Salt Lake City. The train will then proceed to Seattle, and the party, at the invitation of Stone & Webster, will spend several days visiting the exposition and electric railway properties there, Mt. Ranier, Victoria and Vancouver, B. C., or other points of special interest in the vicinity of Seattle. Two or more days will be spent in San Francisco, Los Angeles and other interesting places, the Mt. Shasta route of California, and possibly the Canadian Rockies will be traversed. To avoid any possible chance for discomfort, the accommodations for the party will be limited to 80.

The entire trip will be on the personally conducted plan, and the cost will include not only the railroad fares, but Pullman accommodations and meals en route.

A large number of New England street railway people have already engaged accommodations for the round trip. Those who cannot make the trip to the Coast will accompany the party as far as Denver. Some of those who have applied for accommodations on this train are:

James F. Shaw, president, American Street and Interurban Railway Association.
R. N. Wallis, president, Accountant's Association.
Paul Winsor, president, Engineering Association.
Charles C. Peirce, vice-president, Manufacturers' Association.
E. G. Connette, general manager, Worcester Consolidated Street Railway Company.
Mrs. Connette.
H. C. Page, vice-president and general manager, Springfield Street Railway Company.
Mrs. Page.
D. Dana Bartlett, auditor, Boston & Northern and Old Colony Street Railway Companies.
Mrs. Bartlett.
John R. Graham, president, Bangor Railway & Electric Company and Lewiston, Augusta & Waterville Street Railway Company.
Mrs. Graham.
H. E. Reynolds, assistant general manager, Boston & Northern and Old Colony Street Railway Companies.
Mrs. Reynolds.
W. W. Sargent, superintendent, Fitchburg & Leominster Street Railway Company.
E. P. Shaw, Jr., general manager, Boston & Worcester Street Railway Company.
Mrs. Shaw.
H. L. Wilson, treasurer, Boston Elevated Railway Company.
Mrs. Wilson.
Franklin Woodman, general manager, New Hampshire Electric Railways.
Mrs. Woodman.
Fred J. Allen, secretary, Atlantic Shore Line Railway.
Mrs. Allen.
Thomas Hawken, superintendent, Rockland, Thomaston & Camden Street Railway Company.
Mrs. Hawken.
C. E. Learned, superintendent inspection, Boston Elevated Railway Company.
Mrs. Learned.
M. H. Bronsdon, chief engineer, The Rhode Island Company.
Mrs. Bronsdon.
Senator Eben S. S. Keith.
Mrs. Keith.

Those desiring accommodations on this train should apply to Charles S. Clark, who can be addressed at 70 Kilby Street, Boston.

POINTS OF INTEREST IN OR NEAR DENVER

A few words in regard to the points of interest in and near Denver and the distances from Denver may be of value in this connection.

Denver itself is a beautiful city, as well as a great commercial center, with a population of 200,000. The first settlement made upon the site of the present city by white men was in 1858, only 51 years ago. It was made by gold seekers who stopped there to try placer mining, but the soil pans out too small an amount of gold to pay to work. A few years later this settlement, which was called Auraria, was consolidated with another one across the river, and the consolidated settlements were called Denver, in honor of Gen. James W. Denver, who was Governor of the Territory of Kansas when that territory included what is to-day the State of Colorado. The discovery of rich gold fields in the Rockies in the early '70's brought a great influx of prospectors, and later discoveries of valuable veins established the industry permanently. The State Bureau of Mines has a magnificent collection of Colorado ores in the basement of the State Capitol, which is well worth seeing.

It is probable that the delegates to the convention will be given a trip over the famous Moffat Road, which is one of the most magnificent scenic rides in the country. Four hours takes the train to the crest of the Continental Divide, 11,660 ft. above sea level. Passengers can spend some time at the crest and be back in Denver for dinner. This ride and the view from the Great Divide is something never to be forgotten.

Those who wish to remain over will find it well worth while to visit Colorado Springs, only 75 miles from Denver, where any number of days can be profitably spent, as the

region about there is filled with natural wonders. Ready access is gained to Pike's Peak, the Cheyenne Canons, Manitou, the Garden of the Gods, and railroad connection is made with the famous mining camps of Victor and Cripple Creek, 40 miles away, through marvelous scenery.

Manitou is 5 miles from Colorado Springs, and is situated at the base of Pike's Peak. A cog road hauls passengers to the summit of the peak (14,108 ft.), from which the view is superb beyond description. Manitou itself is beautifully located. The famous springs are within the town limits; they are enclosed by basins and the waters are free.

The Royal Gorge is situated 90 miles west of Colorado Springs, on the Denver Rio Grande, which railroad runs through the gorge. The rocks rise precipitously on either side from 1000 ft. to nearly 3000 ft. in height, with the Arkansas River running alongside the railroad. At one point the canon narrows to 30 ft. in width, while the perpendicular granite towers on either hand to a height of nearly half a mile.

The drives through the Cheyenne Canons and through the Garden of the Gods can be made easily from Colorado Springs, and are worth the time necessary, one day each. At Colorado Springs the principal hotel is the Antlers, where excellent accommodations can be secured.

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THE TRAMWAYS OF BOMBAY, INDIA

Indian Industries and Power for February, 1909, contains an extended article on the electric railways of Bombay, India. The Bombay tramways were opened with animal traction in 1874 with money furnished by New York capitalists. New owners undertook electrification in 1906, and the first section of the system was opened to electric traction in May, 1907, and completed in May, 1908, by J. G. White & Company, Ltd., of London. The route mileage of the tramways is 20.38 miles, and is double track with the exception of 1/2 mile.

The general traffic conditions in Bombay differ widely from those in Europe or America, as a large proportion of the laboring class is too poor to ride frequently, while on the other hand most of the resident Europeans of the upper class and many rich natives keep their own carriages. The bulk of the tramway passengers, therefore, has to come from the middle-class traders, shop keepers and artisans. As wages and salaries are on a considerably lower scale than in other countries, the fares are necessarily low. The highest fare in the Bombay system on the ordinary cars is 1 1/2 annas (3 cents), for which passengers can ride 7 miles. Half-fares are given only to children. The average fare is about 2 cents per passenger carried, and the traffic is at the rate of 1,574,000 passengers per route mile per annum. The operating expenses, exclusive of depreciation, average 9 cents per car-mile. The first-class fare is about 50 per cent higher than on the ordinary cars, but it apparently has not worked out very well, as the cheaper cars are so comfortable that the Europeans and upper-class Indians are satisfied to patronize them. The company, therefore, is gradually converting all its cars to that class. This is a rather interesting fact, as in the early days of horse traction there was considerable reluctance on the part of the high-caste Hindoos to mix with those of the lower castes; the lowest caste Hindoos, however, are not permitted on any cars. Owing to the narrow streets, the motormen are usually restricted to a schedule speed of 7 m.p.h.

The present power station consists of two 1000-kw turbo-generators and one 1000-kw reciprocating engine set. The

new plant will have an initial installation of two 2000-kw turbo-generators. The substations are furnished with motor-generator sets and are suitable for either the railway or three-wire d.c. power and light distribution. Except in the case of elevators and industrial plants, the rates for supply are on the maximum demand system at 16 cents per kw-hour for the equivalent of the first hour's use a day of the maximum demand, and 4 cents per kw-hour for all further consumption. This rate averages slightly less than 8 cents per kw-hour, and is much lower than that obtaining in other Far Eastern cities.

An interesting feature of the overhead construction of the Bombay lines is the high clearance of 21 ft. to 21 ft. 9 in. required to avoid interference with the portable shrines or mosques carried during religious festivals. The tracks are standard gage, with manganese special work. The cars are of the single-deck type, and are supplied with Hudson-Bowring wheelguards. As most of the natives cannot read, destination markers consisting of colored disks in the day or colored lamps at night are provided in addition to the lettered destination signs.

The following statistics, showing the progress of the company's two departments, will be of interest:

	TRACTION DEPARTMENT.			
	1905— Horse Traction.	1906— Horse Traction.	1907— Horse and Electric.	1908— Horse and Electric.
Passengers carried	25,119,426	24,863,228	25,766,916	30,486,666
Car mileage	2,733,073	2,749,467	2,825,385	3,434,263
Gross passenger receipts..	\$470,488	\$491,010	\$512,744	\$497,080
Average fare per passenger in cents.	1.96	1.96	1.86	2.00

Note.—Electrification commenced in May, 1907, and completed in May, 1908.

	ELECTRIC SUPPLY DEPARTMENT.			
	1905—3 months' operation.	1906.	1907.	1908.
Lamp connection at end of year, equivalent 30 Watt..	16,619	59,056	84,598	123,430
Gross revenue	\$2,687	\$49,998	\$104,810	\$232,263
Units sold	26,148	531,731	2,058,805	5,263,630
Revenue per unit sold in cents	10.14	4.16	5.02	4.32

The greater portion of the generating and tramway plant and the rolling stock was supplied by the Brush Electrical Engineering Company, Ltd., and the cables by Callender's Cable & Construction Company, Ltd. The manganese special work was supplied by Edgar Allen & Company.

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NEW CARBON BRUSH

The Speer Carbon Company, of St. Mary's, Pa., is now making a new grade of carbon brushes, manufactured in accordance with the specifications recommended by the committee on maintenance and inspection of electrical equipment, at the convention at Atlantic City last year. These brushes are classed as grade H, and are manufactured in four different degrees of hardness for all classes of work. Grades H and H-1 are soft, and are intended for use on slotted commutators; grade H-3 has proved equally satisfactory on both slotted and non-slotted commutators; grade H-8 is for motors which require a very hard brush to cut the mica.

The manufacturers especially recommend grade H-3 brushes, which have more than surpassed expectations in factory tests and in actual service on several roads. It is claimed that they have given excellent service where other makes have failed. These brushes are said to be free from laminations, perfectly homogeneous, very close grained, low in resistance, high in conductivity, and, in fact, possessing every quality that can be put into a high-grade brush. Although the first cost is necessarily quite high, the manufacturers claim that the ultimate cost is low, as the new brushes will not scratch the commutator or chip or break under the most severe conditions.

News of Electric Railways

New Ordinance Drafted in Kansas City

The Metropolitan Street Railway, Kansas City, Mo., has accepted the modified ordinance of the sub-committee of the West Twelfth Street trafficway committee providing new terms to govern its relations with the city. The ordinance will be submitted to the whole trafficway committee, which will report the ordinance soon.

The principal provisions of the preliminary ordinance which was drawn as a basis for negotiations between the company and the city were given on page 1136 of the *ELECTRIC RAILWAY JOURNAL* of June 19, 1909. Since that ordinance was drawn many sessions have been held at which the matter has been discussed, with the result that a number of modifications have been made to the first draft. These have all been incorporated in the new act, which imposes briefly the following conditions:

The several companies now comprising the Metropolitan system shall be merged into one within one year after the acceptance of the ordinance, and the penalty for failure to consolidate within that time is a forfeiture to the city of \$500,000. If the company accepts the ordinance it is to pay annually to the city during the 16 years of its unexpired franchise 50 per cent of its net profits or 5 per cent of the gross receipts in the event that the percentage on the gross receipts exceeds the amount that would be realized on the net. At the end of the 16 years of the unexpired franchise in June, 1925, the right of the city to buy the property for municipal operation, or to nominate a buyer, accrues. Every six months, twice a year, after 1925 the city can tender to the company the agreed price, based on a capitalization of \$33,500,000 (\$28,140,000 for the Missouri lines and \$5,360,000 for the Kansas lines) plus any additions, or nominate a buyer, who is to pay the city 10 per cent premium for its option.

At the end of the 16 years of the unexpired franchise, during which the city is to participate in the revenues of the company (city's share estimated at from \$10,000,000 to \$14,000,000), the city agrees in return to continue the profit sharing arrangements for 16 years more, or an equal number of years, but reserving the right to enforce its option twice a year during the 16 years to buy the property or nominate a buyer and receive 10 per cent premium.

The franchise of the company in Kansas City, Kan., expires in 1923, and if it should develop that the franchise is not renewed then the value of the Kansas lines, if acquired by the Metropolitan Street Railway or any other company, is to be deducted from the general stated capitalization of \$33,500,000, which includes the value of both the Missouri and Kansas lines.

After 1925 the city is to have the right to regulate the fares to be charged day and night. Prior to 1925 the city is authorized to reduce fares between the hours of 5 and 8 and 5 and 7 p. m. from its net receipts, and other hours of the day if it is so inclined. A new schedule of fare is agreed to by the company, and permits a child under 12 years of age to ride for half fare and under 7 years free if accompanied by parent or guardian.

The fare after 1925 is to be reduced by the city to a basis of permitting but 6 per cent profit to company's capital investment. Universal transfers are to be given within the corporate limits of Kansas City, Mo.; Kansas City, Kan.; Rosedale, Kan.; Argentine, Kan. The company must secure permission from the board of public works to sell unnecessary property, receipts of such sale to be deposited in bank and expended as directed by the board. The board of public works is to have direct control over all new extensions, the company to build two and one-half miles of double track or five miles of single track a year if so directed. All paving and work of construction is to be done to the satisfaction of the board of public works, the company to pave between its tracks and 18 inches outside the rails.

The company is to pay its share in the construction of viaducts and bridges where its cars cross at grade steam railroads or across streams, and is to waive any damages for the grading or regrading of streets on which it has tracks laid. It is also to hold the city harmless from damage. The city reserves right to permit any other street car company to operate cars over the tracks of the Metropolitan Street Railway for three consecutive blocks. The company is to pay personal injury claims out of gross receipts derived from operation. The board of public works is to have a voice in the regulation of salaries of the directors, officers, agents and attorneys of the company. The city is to be represented on the board of directors, thereby securing all the rights of a stockholder. The company is to pay one-third of the land

damages and grading and one-third of the cost of the viaduct for the West Twelfth Street trafficway and to advance the city's two-thirds share of the land damages, grading and building of viaduct. The money advanced is to be paid back from the city's net revenues. The city reserves police power and right of regulation and control, and the company shall carry passengers over the extensions and the main line for the fare charged with full transfer privileges. The city is to have supervision of all future construction and equipment constituting extensions of and additions to plants and property provided for or required by this contract. The board of public works shall have the power to determine what work shall be treated as construction, reconstruction, equipment, extensions, new lines, or additions to plant or property.

The company shall at all times operate sufficient cars adequately to handle traffic, and within a year is to put into service 50 new cars, the city to have authority in the general routing of cars. After Jan. 1, 1914, the company is to deposit each and every year a sum equal to 4 per cent of its gross earnings to constitute a reserve fund for taking care of renewals, betterments and depreciations. If the city does not buy before 1941, or nominate a buyer, should any other company be given a franchise to operate a street railway it is first in duty bound to buy the property of the Metropolitan Street Railway. Every year after 1925 the company and the city are to set apart a sum equal to 4 per cent from the net receipts to be used for the reduction of capitalization. The city is to have an auditor at the company's headquarters, to have daily access to the books of the company and to make annual reports. The company is to file a bond in the sum of \$100,000 with the city clerk to indemnify the city against all damages, judgments, decrees, costs and expenses which the city may suffer to privileges granted in the ordinance.

The ordinance is to be submitted to the voters of the city within 60 days after it is enacted, and is to become effective on Jan. 1, 1910. The expenses of the election are to be defrayed by the company.

Cleveland Traction Situation

Frank A. Scott, one of the receivers of the Municipal Traction Company under Judge Robert W. Taylor, has presented his resignation and will sail for Europe within a few days. Judge Taylor is on a vacation, but Mr. Scott talked the matter over with him before he left and this step was understood. The resignation will be formally accepted on the return of Judge Taylor about Aug. 1. In his letter Mr. Scott states that the special work which he was appointed to perform is about completed and that his services are not urgently needed. This work was to reorganize the accounting department, look after the finances and take such steps as necessary regarding the payment of claims. It is understood that Mr. Bicknell, who has cared for the physical property, primarily, will hereafter have complete charge of all matters and that no one will be appointed to succeed Mr. Scott. After his return from Europe Mr. Scott will become secretary and treasurer of the Warner & Swasey Company, manufacturers of telescopes and fine machine tools.

The committee of 100 has opened offices on the street floor of the Williamson Building, corner Euclid Avenue and the Public Square, where a force of clerks and stenographers are getting material into shape for the campaign against the Schmidt grant on Payne Avenue. A circular issued several days ago by the committee calls the attention of the public to the misstatements made by Mayor Johnson to the effect that the committee favors a 5-cent fare and that the Taylor plan will result in that rate, if adopted. It is shown that the Schmidt grant contains practically no provisions that are binding, and that if it is upheld by the voters, Mr. Schmidt will have a franchise that will allow him to do practically as he pleases on the short strip of road mentioned. All the conditions about which the Mayor has been speaking are contained in the extension grants and not in the original. The committee is not urging the adoption of the Taylor ordinance just as drawn, but favors the plan as it provides for service at cost after the owners have realized 6 per cent on their investment.

Herman J. Schmidt, to whom the Payne Avenue grant was made, has announced that he is organizing the Cleveland Traction Company, to which the grants will be transferred in case they are upheld. This company, he says, will do the necessary construction work. It will have a pre-

liminary capital of \$10,000, but this will be increased to \$2,500,000. Mr. Schmidt has stated that the new company will reimburse the people who owned stock in the Forest City Railway and exchanged it for stock of the Cleveland Railway.

On July 7 the Retail Board of the Cleveland Chamber of Commerce issued a circular containing what is called the merchants' platform, in which their ideas on traction matters are given. The first clause declares that the traction warfare should end; the second asserts that the plan formulated by Judge Taylor is the best that has yet been devised; the third says that the majority of the people are in favor of this plan; the fourth reiterates the right of citizens to express their opinions, without interference from any one, and the sixth deplors the fact that the Mayor of the city stooped to issue a boycotting circular which affected 15 local retail houses. The platform is signed by the executive committee of the board.

A meeting held by Dr. F. W. Walz, Democratic councilman from the First ward, who has withdrawn his support from the Mayor, was almost disrupted on the evening of July 9 by the determination of Councilmen Bernstein and Zinner to reply to Dr. Walz, who had stated that the meeting was held for the purpose of explaining his position to his own constituents and that he wished all questions or remarks confined to people living in the ward. Dr. Walz complains that an organized effort was made by the friends of the Mayor to break up the meeting.

Transit Affairs in New York

Samuel Rea, second vice-president of the Pennsylvania Railroad, and president of the Pennsylvania Terminal Company, addressed a letter to William R. Willcox, chairman of the Public Service Commission of the First District of New York, on July 9, urging the necessity of a subway on the west side of New York, in which he said in part:

"Referring to the many plans regarding new subways in New York which your commission is now considering, on behalf of the Pennsylvania Railroad Company, I beg to advise you that by next summer our New York tunnel railroad and the station at Seventh Avenue and Thirty-third Street will be opened to the public, and the necessity for subway accommodation in connection therewith is so imperative that we deem it our duty to lay the matter before you.

"We have taken every opportunity to bring before the authorities of the State and City of New York the necessity for rapid transit connection, but, notwithstanding the approaching completion of our railroad lines and station, no subway has as yet been constructed.

"We have always believed that the present subway was utilized to its full capacity, and for new subways required, as is now the case, the most economical and practical course would be to extend the present subway from Forty-second Street down the west side under Seventh Avenue to the downtown district, connecting with Brooklyn, and up the east side from Forty-second Street to the Bronx, with suitable crosstown connections, permitting of convenient transfers from one line to the other. From the time that the plan for a west side subway was approved by the predecessors of your commission—the Board of Rapid Transit Commissioners, who recommended it—the wisdom of that course has been conceded by those who have, not only as a public duty to the city and State, but because of their business affiliations, been observers for many years of the rapid transit situation.

"That board in transmitting to the Board of Aldermen for its approval in May, 1905, the Seventh Avenue route to which I refer stated that the completion of the Pennsylvania Railroad station, which would bring many thousand travelers hourly from New Jersey and Long Island to the neighborhood of Thirty-second Street, between Seventh Avenue and Eighth Avenue, should find the municipality prepared to distribute these multitudes to their ultimate destinations in the city.

"Your commission will appreciate that we are not merely observers of the situation, for our own system, including the Long Island Railroad, is spending more than \$125,000,000 for the improvement of transportation facilities in and adjoining New York City, and the largest part of this expenditure is made in the district over which your honorable commission has jurisdiction, in securing convenient transit in and out of Manhattan Borough. We have provided a station in the heart of New York City, at Seventh Avenue and Thirty-third Street, which is unsurpassed in size and accommodations; we have two tunnels from that station under the North River, physically connecting the railroads of New Jersey, Pennsylvania, and the Western and Southern States with the City and State of New York; have provided four tunnels from that station under the East River directly

connecting with the Long Island Railroad and all parts of Long Island.

"We now, therefore, respectfully call the earnest attention of your commission—the body legally existing for that purpose—as we did to your predecessors, to the responsibility of the citizens of this State, and especially of the City of New York, not only to advocate but to take all proper steps to secure convenient rapid transit facilities on the west side of the Borough of Manhattan which the necessities of the situation imperatively demand, and the importance of providing which at the earliest practicable date cannot, I am sure, be overestimated.

"We shall be very much obliged if the commission will kindly advise our company as to its views on this subject and what measures will be taken to relieve the situation by providing rapid transit facilities under Seventh Avenue, which the Pennsylvania Railroad Company through its Pennsylvania Tunnel & Terminal Railroad, a corporation of the State of New York, will be glad to further to the best of its ability.

"As this is a matter of urgent public interest we will advise the Mayor of the city of the transmission of this letter and request his co-operation. We also believe it advisable to allow this letter to be published and will in due course take such action."

Chairman Willcox, of the commission, replied to Mr. Rea under date of July 10 in part, as follows:

"I quite agree with you as to the necessity for thorough and prompt action in order to accommodate the travel that will result from the opening of your railroad and this station, and this commission has been giving very careful attention to this matter.

"It is quite true that the Board of Rapid Transit Railroad Commissioners, predecessor of this commission, laid out an extension of the present subway from Forty-second Street down Seventh Avenue in 1906. This route was included by that commission among the routes it offered to bidders in April, 1907, but no bids were received for such routes either from the Interborough Rapid Transit Company or from any other company.

"Accordingly, your criticism of the present situation might have been more properly sent to that company months ago than to this commission at this time. Although the Interborough Rapid Transit Company began advertising to the public in daily newspapers in April, 1909, that it was ready to go ahead in the matter of an extension down Seventh Avenue, it was not until July 18, 1909, that the proposal of that company for any such extension was received by this commission. It has not been put over until fall as indicated by some of the newspapers.

"Until extensive amendments were made to the Rapid Transit act by the last Legislature, approved by the Governor on May 26, 1909, it was not possible for any rapid transit construction to be made.

"In the matter of available municipal funds for rapid transit construction, I have to state that this commission sent to the Board of Estimate and Apportionment, in May, 1908, for its approval, certain contracts for subway construction in Brooklyn which required an appropriation at that time of about \$3,000,000.

"The Board of Estimate and Apportionment was restrained by an injunction obtained by a taxpayer from taking any action on the application of this commission, on the ground that the debt limit of the city had been exceeded, and this matter is still undetermined by the courts. In view of this, the commission has not felt it practicable to submit any other proposals to the Board of Estimate and Apportionment requiring municipal funds for construction."

As a result of the letter of the Pennsylvania Railroad to the Public Service Commission regarding the proposed subway in Seventh Avenue, Arthur J. Baldwin, counsel for the Bradley-Gaffney-Steers Company, which has filed a proposal to build a subway system in New York, conferred on July 12 with Chairman Willcox of the Public Service Commission. While neither Mr. Willcox nor Mr. Baldwin would discuss the meeting, it was learned that the Bradley-Gaffney-Steers Company has under consideration a modification of its proposal to the Public Service Commission, so as to include the tunnel suggested by the Pennsylvania Railroad, and that it will file such an amendment in the near future.

Work of the Public Service Commission, First District

The Public Service Commission of the First District of New York completed its second year of work on July 1, 1909. In speaking of the work of the commission on July 2, William R. Willcox, chairman, said:

"Inasmuch as the greatest problems before the commission lie in the field of transportation, the bulk of our work has been directed largely to paving the way for new rapid

transit facilities and increasing and improving the service on existing lines. The commission has encouraged the entrance of competitors into the traction field and has framed a law, which was passed by the Legislature, amending the Rapid Transit Act so that New York City now has three ways of building rapid transit lines against one method allowed by the old law. It has also proposed and advocated the passage of a constitutional amendment, which will be submitted to the people next Fall, providing that bonds used for the construction of self-supporting rapid transit lines will not be included in computing the debt limit, thus adding about \$100,000,000 to the city's borrowing capacity.

"During the last two years the commission has planned a new system of subways to connect the boroughs of Manhattan, the Bronx and Brooklyn, and as soon as the detailed plans and forms of contracts can be prepared—a work that will be pushed immediately—will advertise for bids for its construction. This system embraces the Broadway-Lexington Avenue route as laid down by the commission, extending from the Battery to and through the borough of the Bronx; the Fourth Avenue subway, extending from the Brooklyn terminal of the Manhattan bridge through Flatbush Avenue extension and Fourth Avenue, Brooklyn, to Forty-third Street, with branches to Fort Hamilton and Coney Island; the Canal Street subway, extending across Manhattan from the Hudson to near the East River, and the Broadway-Lafayette subway in Brooklyn, leading from the Brooklyn terminal of the Williamsburg bridge out Broadway and back through Lafayette Avenue to a junction with the Fourth Avenue subway. The commission has also prosecuted work on the Brooklyn Loop subway, which is to connect the Manhattan terminals of the Brooklyn, Manhattan and Williamsburg bridges, and which, when completed, will form an important part of the new system. It is hoped to complete the plans and contracts so that advertisements for bids for the construction of this system will be made in the Fall.

"It has been the fortune of the commission to witness the relief of the Brooklyn bridge crush by the extension of the city subway to Brooklyn, and by the practical elimination of delays caused by trolley cars.

"The present subway has claimed a great deal of attention from the commission. Its service has been improved in many ways, and the commission has recently ordered the equipment of all cars used in the express service with side doors. The commission has also provided for the lengthening of the station platforms in the subway, so that they will be able to accommodate 10-car express trains and 6-car local trains, the present platforms being limited to 8-car express trains and 5-car local trains. The speed control system, recommended by Bion J. Arnold, consulting engineer to the commission, has been tried with good effect and the Interborough Rapid Transit Company plans to extend it until the entire express service will be covered.

"When the commission was created it was found that the loss of life from accidents on railroads and street railroads within Greater New York amounted to nearly 600 persons a year. By the installation of airbrakes and the use of better life-saving devices, together with the overhauling of cars and the maintenance of their machinery in first-class condition, there has been a great improvement in this respect. For the last month reported only 32 lives were lost by such accidents, and if this ratio is kept up the total for the year will be less than 400—a saving of one-third over the annual record of two years ago.

"It is not the commission's fault that transfers on Fifty-ninth Street have not been restored. When these were cut off the commission held an investigation, which resulted in the passage of orders directing the Metropolitan Street Railway and the Central Park, North & East River Railroad to make joint rates for the transportation of passengers over their lines. The companies, however, resisted the order in the courts and obtained through writs of certiorari the right to have a judicial review of the commission's action. The restoration of transfers, therefore, is suspended pending this review."

New Franchise Drawn as Basis for Negotiations in Des Moines.—W. H. Baily, corporation counsel of Des Moines, Ia., has drafted a franchise to extend the rights of the Des Moines City Railway for 25 years as a basis of negotiations between the city and the company. The ordinance will be read before the Council and will then be submitted to the company. Until this has been done the provisions of the measure will not be made public.

Resolution to Re-Submit Municipal Ownership in San Francisco.—A resolution has been submitted to the Board of Supervisors of San Francisco, and referred by that body to the public utilities committee for consideration, to re-submit to the voters of San Francisco at an early date the

question of reconstructing and conducting the Geary Street, Park & Ocean Railroad as a municipal enterprise. This question was before the voters on June 24, and as noted on page 48 of the *ELECTRIC RAILWAY JOURNAL* of July 3, 1909, was defeated.

Municipal Line at Calgary Opened.—The municipal electric railway at Calgary, Alta, Can., representing an investment of about \$500,000, was opened for traffic on July 5. The line consists of five miles of double track and seven miles of single track. Power is supplied from the municipal light plant of Calgary, which was extended to meet the requirements of the railway. Pay-as-you-enter cars are in use. A paid commission of three members, of which the Mayor is chairman, manages the city, and is in charge of the railway, with Thomas McCauley as their representative, with the title of superintendent.

Report of Accountants on Chicago Railways Company.—A report of Price, Waterhouse & Company concerning the accounts of the Chicago Railways Company has been made public. The investigation on which the report is based was made at the request of Mayor Busse of Chicago. The report from beginning to end was without censure, and pointed out that all the errors contributing to the \$254,487.81 correction, insisted upon by the Board of Supervising Engineers, were caused by a misunderstanding of the ordinance requirements and mistakes which easily can be made in handling complex problems connected with traction accounts.

Columbus Terminal Ordinance Repassed.—The ordinance granting the Ohio Electric Railway, Columbus, Ohio, permission to erect its proposed union station has been passed in Council over the veto of Acting Mayor Rightmeyer. The measure provides that an interurban station to cost \$175,000 shall be erected at Third and Town streets by Jan. 1, 1913. The ordinance was immediately referred to Mayor Bond, who declared he would announce his decision regarding the measure in a few days. The ordinance as passed provided for the abandonment of what is known as the loop, for the sale of seven tickets for 25 cents within the city and for an eight-year extension of the present franchise of the company.

Cascade Tunnel Electrification.—The work of electrifying the Cascade Mountain Tunnel of the Great Northern Railroad is practically complete, and the power houses will probably be ready for operation by Aug. 1, 1909. While no date has yet been fixed for putting the full electrical service into operation in the tunnels, it is expected that this will be done before the end of August. The present electrified line is about 6 miles long, including the yards and switches at the ends of the Cascade tunnel, which is almost 3 miles long. Already several work trains are operated in the tunnel by electric locomotives, but regular service will not be undertaken until the power stations are completed. If the present installation proves successful, the entire Cascade Mountain division of the Great Northern Railroad, which is about 60 miles long, will be electrified.

Electrolysis Report in Winnipeg.—Professor Herdt, of Montreal, the expert who was employed by the city of Winnipeg to inquire into the electrolysis situation in that city, has presented his report to the Board of Control. Briefly it recommended that the company do considerable rebonding, especially around special work, and should install some additional substations to reduce the amount of current returned on the rails. He states, however, that the company has already started to carry out these suggestions and has placed orders for the equipment of three substations and is planning to rebond a number of its important lines. The report is the result of a charge made some time ago by the city electrician that a fire had been caused in one of the principal sections of the city by stray railway current. This has been found not to be the case by Professor Herdt.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—The resolution requiring the joint committee of the Senate and the House which has under consideration the public utility matter to report by July 8 was not acted upon in the Senate and therefore was ineffective. Mr. Scott, Plymouth, said last week that he would not attempt to predict the date on which the report is likely to be made. Later he said that it was possible that the committee might report some time during the week of July 12. The judiciary committee of the House has reported favorably the amendment to the law regarding intimidation and boycott. This amendment modifies section 1296 so that it reads as follows: "Every person who shall threaten or use any means calculated to intimidate any person, or compel such person against his will to do or abstain from doing any act which such person has a legal right to do, or shall persistently follow such person in a disorderly manner or injure, or threaten to injure his property, with intent to intimidate him shall be fined not more than \$100 or imprisonment not more than six months."

Financial and Corporate

Third Avenue Railroad Reorganization

New York Stock and Money Market

July 13, 1909.

Little change has taken place during the last week in the quotations for the majority of the securities listed on the New York Stock Exchange. The advances and declines by most stocks represented the restricted trading which makes the regulation summer market a dull one. News and gossip continued bullish; crop reports furnish additional basis for the support of prices on a level that anticipates future prosperity in all lines of trade. New York traction securities average a little lower than a week ago. Bonds are in excellent demand.

Rates for call loans in New York remain nominal, and throughout the country funds are plentiful. Rates to-day were: Call, 1/4 to 2 per cent; time, 2 to 2 1/4 per cent for 60 days, 2 1/2 per cent for 90 days, 2 1/2 to 2 3/4 per cent for four months, 3 per cent for five months, and 3 1/4 to 3 1/2 per cent for six months.

Other Markets

Little activity has developed in traction issues in the Philadelphia market. Philadelphia Rapid Transit stock has fluctuated within about a point.

Trading in electric railway stocks in Chicago was quiet with the general market in that city. Kansas City Railway & Light preferred was quiet and receded only fractionally from the advance of the preceding week. Quotations for various elevated railroad securities were a trifle lower.

Massachusetts Electric Companies preferred improved in price in the Boston market, selling up from 70 to 72 1/2, but one-half of this gain was lost under subsequent trading. Boston Elevated was a little easier.

United Railways & Electric funding 5 per cent bonds were stronger in the Baltimore market, selling at 85, an advance of 2 1/2 over the preceding week. The 4s were practically unchanged at 87 and the income bonds were quoted at 57 1/2.

Quotations of various traction securities as compared with last week follow:

	July 6, 1909.	July 13, 1909.
American Railways Company.....	445 1/2	45
Aurora, Elgin & Chicago Railroad (common).....	440 1/2	39 1/8
Aurora, Elgin & Chicago Railroad (preferred).....	a87	a87
Boston Elevated Railway.....	129 1/2	129
Boston & Suburban Electric Companies.....	*16	*13 1/2
Boston & Suburban Electric Companies (preferred).....	*71	*71
Boston & Worcester Electric Companies (common).....	10	10
Boston & Worcester Electric Companies (preferred).....	52 1/2	a56
Brooklyn Rapid Transit Company.....	79 1/2	77 3/4
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	86 3/4	86
Capital Traction Company, Washington.....	a139	a138
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	*3	*2 1/2
Chicago & Oak Park Elevated Railroad (preferred).....	*12	*10
Chicago Railways, ptcptg, ctf, 1.....	a113	a112 1/2
Chicago Railways, ptcptg, ctf, 2.....	410 1/2	439 1/2
Chicago Railways, ptcptg, ctf, 3.....	a28	a26 1/2
Chicago Railways, ptcptg, ctf, 4s.....	a10	a10 1/2
Cleveland Electric Railway.....	*78	*78
Consolidated Traction Company of New Jersey.....	a76 1/2	a76 1/2
Consolidated Traction of N. J. 5 per cent bonds.....	a106 1/2	a106 1/2
Detroit United Railway.....	a62	a63 1/2
General Electric Company.....	164 3/4	164
Georgia Railway & Electric Company (common).....	92 7/8	a92 3/4
Georgia Railway & Electric Company (preferred).....	87	89
Interborough-Metropolitan Company (common).....	16 1/2	15 1/2
Interborough-Metropolitan Company (preferred).....	49 3/8	47 3/4
Interborough-Metropolitan Company (4 1/2).....	80	80 3/4
Kansas City Railway & Light Company (common).....	51	a50
Kansas City Railway & Light Company (preferred).....	83	83 3/4
Manhattan Railway.....	a147	a146
Massachusetts Electric Companies (common).....	a134	13 1/2
Massachusetts Electric Companies (preferred).....	70	71 1/2
Metropolitan West Side, Chicago (common).....	a17	a16 1/2
Metropolitan West Side, Chicago (preferred).....	a48 1/2	a48
Metropolitan Street Railway.....	18	a20
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	83 3/4	82
Northwestern Elevated Railroad (common).....	a23	a22
Northwestern Elevated Railroad (preferred).....	a70	a69
Philadelphia Company, Pittsburg (common).....	42	a42
Philadelphia Company, Pittsburg (preferred).....	43	43
Philadelphia Rapid Transit Company.....	28 3/4	28 3/4
Philadelphia Traction Company.....	91	91
Public Service Corporation, 5 per cent, col. notes.....	a100 1/2	a100 1/2
Public Service Corporation, cts.....	a89	a89
Seattle Electric Company (common).....	*112	*102
Seattle Electric Company (preferred).....	103	103 1/2
South Side Elevated Railroad, Chicago.....	a55	a55
United Railways & Light Company.....	39	39 1/2
Third Avenue Railroad, New York.....	18	17
Twin City Rapid Transit, Minneapolis (common).....	a104	103 1/2
Union Traction Company, Philadelphia.....	a53 1/2	53
United Railways & Electric Company, Baltimore.....	11	12
United Railways Inv. Co., San Francisco (common).....	a39	a38
United Railways Inv. Co., San Francisco (preferred).....	56	a55 1/2
Washington Railway & Electric Company (common).....	a42 1/2	a42 1/2
Washington Railway & Electric Company (preferred).....	a91	a90 3/4
West End Street Railway, Boston (common).....	a93	92 1/2
West End Street Railway, Boston (preferred).....	*106	104 1/2
Westinghouse Electric & Manufacturing Company.....	a85	a84 1/2
Westinghouse Elec. & Mfg. Company (1st pref.).....	a121 1/2	a121 1/2

a.Asked. *Last sale.

The final hearing before the Public Service Commission of the First District of New York on the plan for the reorganization of the Third Avenue Railroad, New York, was held on July 11. John M. Bowers, counsel for the bondholders' committee, said that the law of the State as he understood it gives the company the vested right to reorganize as it may see fit, the functions of the commission in this matter being only ministerial. In referring to the expenditures for the change of power from horse to cable and from cable to electricity, he said that they had been made with the consent of the stockholders. Referring to the disappearance of funds which, it is said, do not show in the physical property, Mr. Bowers said that an inquiry would prove enormously expensive, and that he did not feel that the mere statement of an officer of the company of occurrences after he had left its employ was sufficient justification for incurring the expense that an investigation would entail. J. M. Perry, representing the stockholders' committee, stated that he believed the majority of his clients are in favor of the reorganization plan.

At the hearing on July 7, counsel for the commission examined Receiver Whitridge as to numerous details in the plan of reorganization. It appeared in the course of examination that the plan was, as Mr. Whitridge expressed it, only an imperfect draft. Mr. Whitridge and Mr. Bowers promised that a more careful statement as to the exact standing of the property would be submitted at an early date. Chairman Willcox, of the commission, asked Mr. Whitridge if he considered it a good plan to issue, in new securities, 100 cents on the dollar for all of the old securities, besides raising some millions extra to provide money for immediate necessities, much of which has been already raised on receivers' certificates and expended. Mr. Whitridge said he thought that the plan was a good one. The receiver also testified that provision had not been made for the tort creditors, except in a comparatively few cases in which judgments had already been secured for damages due to accidents. It was brought to Mr. Whitridge's attention that in the transfer hearing some months ago he had testified that 10 per cent of earnings was needed for a depreciation fund, whereas in the present estimate only 5 per cent is allowed. He said that he thought that that would be sufficient for the present.

William N. Amory, who at one time was secretary of the Third Avenue Railroad, was the principal witness on July 8. Mr. Amory is a stockholder of the company, and said that he will not pay the stock assessment. He expressed the opinion that the Third Avenue Railroad cannot earn the interest demanded under the plan of reorganization.

Anderson (S. C.) Traction Company.—The property of the Anderson Traction Company will be offered for sale by J. A. Brock, special master, Anderson, S. C., at public auction in Anderson on Oct. 12, 1909, in accordance with the decree filed by the United States Circuit Court in the district of South Carolina in suit brought by the International Trust Company of Maryland.

Black River Traction Company, Watertown, N. Y.—William B. McKinley, Champaign Ill., president of the Illinois Traction System, has made overtures for the purchase of the property of the Black River Traction Company.

Chicago (Ill.) Railways.—It is reported that negotiations are under way for the sale of the property of the Consolidated Traction Company to Chicago Railways' interests. The underlying bondholders of the Chicago Consolidated Traction Company, however, are understood not to be satisfied with the overtures for the sale of the property so far made to them.

Chicago & Milwaukee Electric Railroad, Chicago, Ill.—The receivers of the Chicago & Milwaukee Electric Railroad are sending a letter as follows to the creditors of the company: "We are enclosing herewith check covering dividend of 50 per cent on your preferred claims as allowed by the court. We expect the court to order payment of the balance in about 90 days." The letter is signed by W. Irving Osborne, D. B. Hanna and George B. Moore, receivers.

Cincinnati & Columbus Traction Company, Cincinnati, Ohio.—It is understood that the majority of the holders of the \$600,000 of first mortgage 5 per cent bonds of the Cincinnati & Columbus Traction Company which fell due on July 1, 1909, have consented to an extension of the time of payment to Jan. 1, 1910, at 6 per cent and interest. The reason for the extension is the desire of the bondholders to facilitate negotiations for the sale of the road to the Southwestern Ohio Traction Company, which has been or-

ganized with a nominal capital of \$10,000 to carry out an extensive plan for interurban railways which John E. Bleekman, New York, and his associates have been working upon for some time. Reference to the organization of the Southwestern Traction Company was made in the *ELECTRIC RAILWAY JOURNAL* of April 24, 1909.

Gallatin Valley Electric Railway, Bozeman, Mont.—The Gallatin Valley Electric Railway, which is building a line between Bozeman and Salesville, has taken over the Bozeman Street Railway and merged it with the Gallatin Valley Electric Railway. New officers have been elected as follows for the Gallatin Valley Electric Railway: H. S. Buell, president; Charles B. Anderson, secretary and general manager; George Cox, treasurer; C. H. Thompson, general freight and passenger agent; A. J. Bush, roadmaster.

Indianapolis, Crawfordsville & Western Traction Company, Indianapolis, Ind.—On application of the Electrical Installation Company, Chicago, Harry J. Milligan, Indianapolis, has been appointed receiver of the Indianapolis, Crawfordsville & Western Traction Company.

Indiana Union Traction Company, Anderson, Ind.—The Indiana Union Traction Company has declared a semi-annual dividend of $\frac{1}{2}$ of 1 per cent on the common stock of the company for the six months ended June 30, 1909. This is the first dividend to be paid on the stock since Jan. 1, 1908.

Interborough Rapid Transit Company, New York, N. Y.—Announcement is made that the subscription books for the \$10,000,000 of 5 per cent bonds of the Interborough Rapid Transit Company, offered by J. P. Morgan & Company, New York, and Lee, Higginson & Company, Boston, have been closed, and that the issue has been largely over-subscribed.

Peninsula Railway, San Jose, Cal.—The Peninsula Railroad, the San Jose & Los Gatos Interurban Railway and the Santa Clara Interurban Railway have been consolidated as the Peninsula Railway, with a capital stock of \$12,000,000. The directors of the company are: J. T. Burke, Paul Shoup, C. B. Seger, P. F. Dunne and F. E. Chapin.

United Traction & Electric Company, Providence, R. I.—The Union Trust Company, Providence, which at one time held 8875 shares of the stock of the United Traction & Electric Company, has exchanged a block of 6000 shares of the company, comprising all its holdings, for stock of the New York, New Haven & Hartford Railroad on the basis of the offer made by the New York, New Haven & Hartford Railroad to the larger stockholders of the United Traction & Electric Company, namely, five shares of the stock of the New York, New Haven & Hartford Railroad for eight shares of the stock of the United Traction & Electric Company. There is \$8,000,000 of stock of the United Traction & Electric Company, and for the past seven years it has received dividends at the rate of 5 per cent per annum.

NEW PUBLICATION

Steam Power Plant Piping Systems. By William L. Morris, M.E., New York: McGraw-Hill Book Company, 1909; cloth, 481 pages and index. Price, \$5 net.

This is the first publication bearing the imprint of the new McGraw-Hill Book Company. The author, who has had wide experience in designing power stations, presents his personal views as to the best method of handling certain problems rather than attempting to cover all the methods in general use. For this reason some of the detail plans described may not meet with the entire approval of other engineers holding different views. This much may be said, however, that the author has followed a rational and consistent theory throughout, namely, to so design all parts of piping system that repairs to any disabled line may be made without interfering with the regular service of the plant. The arrangement of the text and illustrations, some 390 in number, is unique. Beginning with general layouts of main piping, the author develops layouts of different systems for each of the separate auxiliary, as services, condensers and heaters, live steam drips, blow-off and exhaust piping, oiling systems, etc. Chapter 10 takes up live steam piping details. Each detail is given a distinguishing number beginning with 1 for the main, 2 for the engine branches, 3 for the boiler branches, etc. All details of the live steam piping are further designated by the prefixed letter A. Vacuum exhaust details are similarly classified in Chapter 11, and are given the prefix B. This method of numbering and lettering each detail is carried out in all of the following chapters. The numerous illustrations admirably supplement the descriptions of design and installation. The drawings in most instances have been made from original sketches of the author.

Traffic and Transportation

C. E. T. A. Joint Passenger and Joint and Local Baggage Tariffs

The Central Electric Traffic Association, under date of July 2, 1909, issued joint passenger tariff No. 2, cancelling joint passenger tariff No. 1, of rate for interchangeable 1000 mile ticket. The new tariff becomes effective on Aug. 2, 1909, and the interchangeable ticket will be honored between all stations of the roads participating in the tariff in Illinois, Indiana, Kentucky, Michigan and Ohio. A list of these roads was published on page 92 of the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909. The rate for the ticket is \$17.50. It is subject to the following conditions:

- A. It is good for bearer or bearer and party.
- B. It is limited to one year, expiring on the date cancelled in the margin thereof.
- C. No detachment will be made for less than five miles for each passenger. Fractions of a mile will be counted as one mile.
 1. A minimum of eight miles will be detached by the Indiana Union Traction Co. when used on limited trains.
 2. No half fare detachment will be made on this ticket.
 3. It will not be honored for city fares.
- D. No portion of the mileage strip will be accepted for passage if presented detached from the cover, nor if not bearing same form and consecutive number.
- E. This ticket is good for passage only on trains designated to carry passengers, and only to and from stations at which such trains are officially scheduled to stop on the line over which it may be honored for passage.
- F. If this ticket is lost, mislaid or stolen, it can not be replaced, neither will notification of this loss be given to the conductors.
- G. The purchase and use of this mileage ticket constitutes the acceptance of its condition by the purchaser.
- H. In selling this interchangeable mileage ticket the company so doing acts as agent only, and assumes no responsibility beyond its own line.
 1. One hundred and fifty (150) pounds of legal baggage, not exceeding \$100 in value, will be checked on this ticket. If baggage is presented for checking for more than one passenger, detachment of baggage strip will be made to cover the distance traveled by each one. Baggage will not be checked until that portion of the mileage strip which has been used for checking has been used.
 - J. No free allowance for baggage will be made on the following lines: Columbus, Delaware & Marion Ry., Columbus, Marion & Bucyrus R. R., Evansville Railways Co., but fourteen (14) passenger miles will be detached for each piece of baggage regardless of weight or distance carried.
 1. On the line of the Lake Erie, Bowling Green & Napoleon Ry. no free baggage will be allowed. A charge for 150 pounds will be 25 cents and 15 cents per hundred points for excess.
 - K. No extra charge will be made for the use of this ticket on limited trains.
 - L. All baggage in excess of the free allowance of one hundred and fifty (150) pounds will be handled in accordance with the rules and regulations as provided in I. C. C. No. 2, I. R. C. No. 2, O. R. C. No. 2, Central Electric Traffic Association Joint and Local Baggage Tariff No. 1, effective August 2, 1909.
 - M. A limited train is one that does not make country or cross road stops, but only makes city or town stops.

The association has also issued joint and local baggage tariff No. 1 covering joint and local rules and regulations and tables of excess baggage rates applying between all stations on the lines participating in the tariff in Illinois, Indiana, Kentucky, Michigan and Ohio, except those expressly designated. This tariff was also issued on July 2, 1909, and becomes effective on Aug. 2, 1909. The following rules and regulations will govern the handling of baggage and the collection of charges on excess baggage:

- Section 1. Baggage may be checked on presentation of proper form of transportation to any destination shown on the lines of participating carriers, but only via route of transportation.
- Section 2. In order to insure prompt forwarding, baggage must be presented for checking at least fifteen minutes before departure of train; but employees are required to use judgment and courtesy in applying this rule.
- Section 3. Under no circumstances will baggage be checked by an agent without presentation by passenger of some legal and regular form of transportation, except baggage forwarded on C. O. D. checks when the entire amount will be handled as excess.
- Section 4. Tickets used for checking of baggage must be cancelled by regular baggage punch or stamp before return to passenger. When baggage is checked short of destination, endorse on back of ticket, "baggage checked to _____" (giving name of destination or station to which baggage is checked).
- Section 5. The participating carriers do not agree or guarantee to forward baggage to its destination on same train with passenger, or within a specified time limit.
- Section 6. Baggage consists of the wearing apparel and such personal effects of passengers as may be necessary for their journey, and will be checked for transportation upon presentation of the proper transportation, if enclosed in locked receptacles, which will insure safe transportation, such as trunks, suit cases, valises, satchels, leather hat boxes, medium size boxes (containing personal effects and provided with suitable handles), sailor and emigrant bags.
- Section 7. When transported between any two points between which the route is wholly within the State of Indiana, the following articles will be included as baggage: The samples, goods, wares, appliances and catalogues of commercial travelers or their employees, and used by them for the purpose of transacting their business and carried with them solely for that purpose, when securely packed and locked in substantial trunks or sample cases, of convenient shape and weight for handling. When any of the articles named in this paragraph are checked between any two points, between which the route is not wholly within the State of Indiana, it is done as a matter of courtesy and the carriers, parties to this tariff, will not be responsible for any loss or damage to contents, reserving the right to refer such passengers to the express companies or departments.
- Section 8. Any of the articles named in sections 6 and 7, which are not enclosed in securely locked receptacles will not be received or

checked, except with the understanding that no liability will be assumed for the loss of or damage to the articles therein.

Section 9. The following articles will be checked at owners' risk and included in the weight of the passengers' baggage: Samp-e school desks and opera chairs properly encased for handling, tool chests, miners' packs, steamer chairs, invalid chairs, saddles in bags, surveyors' tools wrapped, baggage as described in section 6, in bundles when properly wrapped in canvas or other strong material (paper wrappers and pasteboard boxes of all kinds excepted), and securely roped, golf, cricket, base ball or other club paraphernalia.

Section 10. Trunks or cases marked "GLASS" or "FRAGILE," or in any other manner indicating that contents are of fragile nature and likely to be damaged by ordinary handling, will not be accepted for transportation in baggage compartments, unless fully released by signature of owner on regular form of release, relieving the carrier from all responsibility.

Section 11. Bicycles and tricycles (not motor cycles) may be checked and transported in baggage compartments, subject to the same charge as for 100 pounds of excess baggage, no charge less than 25 cents; except that for points wholly within the State of Ohio BICYCLES will be carried FREE. The charge for bicycles and tricycles is separate from and has no connection with that for excess baggage proper. Not more than one bicycle or tricycle will be checked for one passenger, between any two points within the State of Ohio. Lamps, cyclometers and tool bags, unless removed from bicycles or tricycles before such articles are checked, will be carried at owner's risk.

Section 12. Baby carriages, go-carts and baby sleighs, containing only necessary articles, such as pillows, robes or blankets, will be checked subject to same charge as for 100 pounds of excess baggage, no charge less than 25 cents. This charge is separate from and has no connection with that for excess baggage proper. Folded go-carts may be carried by passengers without checking.

Section 13. ARTICLES THAT MUST NOT BE CHECKED ARE: Animals, automobiles or motor-tricycles or similar vehicles, band boxes, bird cages, boxes or barrels of fruit, buggies, bundles, burial devices, explosive matter, furniture, gambling devices, game, groceries, goods of extraordinary value, household goods, jewelry, liquids of any class, machinery, merchandise, money, bonds and other securities, musical instruments, moving picture films, oil, gas or gasoline stoves, paper packages or pasteboard boxes, patent fence gates or ladders, perishable articles, pianos, piano movers, scales, sewing machines, shawl straps, tricycles with any cabinet attachments, trunks or valises with bundle attached, valuable laces, wagons or carts and other property liable to suffer damage from ordinary handling, or that can not be handled, loaded and piled the same as ordinary baggage. Refer parties presenting such articles to the freight or express agent.

Section 14. Perishable articles, jewelry, merchandise, money or property excessive in value, enclosed in baggage, will be at owner's risk of loss or damage, arising through any cause whatever, as it is not the intention of the participating carriers to become responsible for such, as baggage, and passengers should be so advised.

Section 15. If a trunk or case is presented which baggage agents have sufficient reason to believe contains jewelry, valuable laces or money, or any other articles prohibited in this section, they will refuse to check, referring passenger to express agent.

Section 16. Between any two points between which the route is wholly within the State of Indiana 150 pounds of baggage not exceeding \$100 in value will be checked free for each passenger presenting full ticket or other full first class transportation, and not exceeding \$50 in value for each passenger presenting half or child's ticket or transportation. See section 31.

Section 17. In all cases not covered by section 16, 150 pounds of baggage, not exceeding \$100 in value, will be checked free for each passenger presenting full ticket or other first class transportation, and 75 pounds, not exceeding \$50 in value, for each passenger presenting half fare ticket or transportation. No baggage will be checked free when the one way ticket fare is less than 25 cents. When the fare is less than 25 cents, the agent may check baggage under the rule by collecting the difference between the ticket fare and 25 cents. In such cases the agent will issue excess baggage check for the amount so collected. This collection is separate and in addition to any charge for excess weight, but may be included and shown on the same check covering any collection for excess weight on same baggage. See section 31.

Exceptions: On the line of the Lake Erie, Bowling Green & Napoleon Railway no free baggage will be allowed. The charges for 150 pounds or less will be 25 cents; 15 cents per hundred pounds excess, same to be handled same as excess, using excess checks on interline traffic.

Section 18. In checking articles named in section 7, all in excess of 150 pounds will be charged for at the same rate as excess baggage, regardless of number of tickets presented, except when it is clearly shown that the commercial traveler is regularly accompanied by an assistant or helper traveling with him and employed by the same firm, 150 pounds additional will be carried free.

Section 19. No piece of baggage weighing over 250 pounds will be accepted or checked as baggage.

Section 20. Baggage in excess of the FREE allowance authorized will be subject to a charge in accordance with the excess charges shown on tables in pages 10 and 11.

Section 21. All baggage must be weighed where possible. Agents will test and balance scales frequently. Ten pounds on any one lot may be allowed for possible variation of scales, but agents must positively refuse to receive or check a piece of baggage weighing over 260 pounds (this exception is not to be construed as allowing over 250 pounds to each piece, but is only allowed for variation of scales).

Section 22. When checking baggage, in case of doubt as to proper weight of same, if impossible to ascertain correct weight, notify agent at destination or transfer point to weigh and collect additional charges, if any.

Section 23. In case of doubt as to proper weight of baggage when received by agent at destination, weigh if possible and collect any additional charges and make full report to proper officer.

Section 24. Storage will be charged on each piece of baggage, either inbound or outbound, checked or not checked, remaining at any station over twenty-four hours as follows: The first twenty-four hours free; the second twenty-four hours or fraction thereof 25 cents; and for each succeeding twenty-four hours or fraction thereof 10 cents. Except baggage received any time Saturday will be held until same hour Monday, and baggage received any time Sunday will be held until midnight Monday without charge. This exception will also apply to all legal holidays. Baggage will be stored subject to the participating carriers' responsibility as warehousemen only, or may be, at their option, removed to and stored in a public or licensed warehouse at the cost of the owner and there he held at the owner's risk and without liability on the part of the participating carrier and subject to a lien for all lawful charges, including the same charges for storage. When baggage has been on hand the free allowance of time, fill out and attach a storage check. When charges are paid and baggage claimed by owner, deliver receipt, and make report to auditor. If baggage is not claimed within ten days, give advice of same to the proper officer.

Section 25. Dogs provided with properly fitting collar and strong chain, when accompanied by owner or caretaker, will be transported over

the lines of participating carriers named herein only on local trains or on limited trains provided with baggage compartment, and at owner's risk. The charge for this service will be the full first class rate of fare with a minimum charge of 25 cents and a maximum charge of 50 cents between any two points on the lines of each carrier, party hereto. Vicious dogs must be crated and handled by express.

Section 26. Baggage checked to points on lines of participating carriers in this tariff where no regular agencies are maintained will be at owner's risk after unloaded at destination. The participating carriers assume no responsibility for protection, care or delivery of baggage unloaded at these points. Double checking will not be permitted. Where baggage is offered to be transported to any point where there is no agent, use a release check which requires passenger's signature to the release.

Section 27. When baggage accompanied by a passenger is received at a station where there is no agent, conductor will check same to point to which passenger pays fare and issue a regular check. (The duplicate check to be given to the passenger). If weight seems in excess of the FREE allowance, indorse check accordingly, calling attention of agent at destination to the fact.

Section 28.—In cases where passengers have lost their checks, collect 25 cents for each check, require them to fully identify their baggage by describing the principal contents and producing the keys to open it. If satisfied that the claimant is the owner, take receipt, with full name and address, and make report of the circumstances to the proper officer. While baggage is checked, passengers must not be permitted to open it.

Section 29. THEATRICAL.—Wearing apparel, stage properties, musical instruments, scenery and small animals crated used in producing a theatrical performance, lecture, or other public entertainment upon the stage of a hall or theater may be transported in baggage compartments subject to limitation in aggregate weight or quantity and minimum number of passengers as follows: provided none of these articles is too bulky to be handled in baggage compartments:

For a company traveling on a ticket for ten or more passengers 150 pounds per passenger will be carried without charge. All in excess shall be charged for at the regular excess rates when transported in regular baggage compartments.

In all cases where animals belonging to theatrical companies are transported in baggage compartments, a release must be executed by the owner or shipper, releasing the participating carrier from all liability for damage or injury to such property, the release to be forwarded promptly to the proper officer.

Section 30. The following instructions cover the issuing and handling of excess baggage and C. O. D. tags:

(a) EXCESS BAGGAGE CHECKS printed on red tag board. One coupon for the auditor of the issuing road, one for the passenger, and one to be attached to the baggage. Whenever excess baggage is to be forwarded fill out one of these checks and attach to the baggage, handing duplicate to passenger and forward auditor's stub to the auditor in your regular report. When the same party has more than one piece of baggage and excess is to be charged, check all but one piece in the regular manner, issue excess check for the remaining piece, showing charge for the total excess on the one excess check. Also show in consecutive order the numbers of free baggage checks issued on this one check in space provided for same. This to enable receiving agent to properly account for all baggage on which excess is charged. Care must be used to see that the proper amount is collected and that the proper weights have been used. Agents receiving and delivering baggage under excess baggage checks will be careful to ascertain the exact amount of excess contained in the baggage and make notation thereof on the excess baggage check.

(b) C. O. D. BAGGAGE CHECKS are printed on blue tag board, and are to be filled out and issued in all cases where charges are to be collected at destination for transportation of baggage, storage, etc. When these checks are issued it is not necessary to issue the regular checks unless there is more than one piece to be checked, in which case follow the same plan as is done with excess baggage. Agents receiving baggage under C. O. D. checks will be very careful to collect all charges shown on C. O. D. baggage checks before delivering baggage to passenger, sending all duplicates to the auditor. Agents must be certain that there is an agent at point of destination before forwarding any C. O. D. baggage. The Toledo, Fosteria & Findlay Railway will not handle C. O. D. baggage.

Section 31. Baggage forwarded via the junction points shown below is subject to a charge for transferring between stations as follows:

Junction.	Between.	Charge per Piece for Transferring.
Crawfordsville, Ind.	T. H. I. & E. Tr. Co. and I. C. & W. Tr. Co.	\$ 25
Kenoa, Ohio	T. P. C. & L. Ry. and L. S. E. Ry.	10
Kokomo, Ind.	I. U. T. Co. and K. M. & W. Tr. Co.	25
Marion, Ind.	I. U. T. Co. and K. M. & W. Tr. Co.	25
	I. U. T. Co. and M. B. & E. Tr. Co.	15
Toledo, Ohio	Ohio Electric Ry. and All Electric Lines	25

In forwarding baggage via these points agents or baggage men will collect amount of transfer and issue excess check to cover, marking it "For transfer at _____." If there is excess on the baggage so checked one excess check will cover both collections. Show the amount collected for transfer separate. If there is more than one piece of baggage for same passenger handle checks same as for excess checking as provided for in section 30a.

The baggage tariff is concluded with mileage tables of the Indiana roads, geographically arranged, excess baggage tables between stations in Indiana, excess baggage tables not for use locally in Indiana, and instructions to employers as to how to find the rate.

Reduction of Fare to Coney Island Asked on Week Days

J. Monheimer, who complained to the Public Service Commission that the fare of 10 cents between Coney Island and Brooklyn, charged by the Coney Island & Brooklyn Railroad on Saturdays, Sundays and holidays was unjust, unreasonable and unlawful, has since Commissioner Bassett rendered his opinion, as noted in the ELECTRIC RAILWAY JOURNAL of July 10, 1909, presented to the commission a request that the commission order the company to charge a 5-cent fare on week days. On the question of the 10-cent fare on Saturdays, Sundays and holidays the commission decided in favor of the company. The question of fares on week days was not involved in the complaint, and the commission declined to pass upon it, although Commissioner Bassett expressed the opinion that such an increase is unreasonable and unjustifiable and of slight profit to the

company, but that the company has a legal right to make such a charge.

Mr. Monheimer sets forth in his new complaint that he has been a resident of Coney Island for 10 years, and that up to Aug. 31, 1908, the Coney Island & Brooklyn Railroad only charged a 5-cent fare on week days, and 10 cents on Saturdays, Sundays and holidays. He adds:

"That the aforesaid rate of transportation to and from Coney Island (10 cents) is unjust, excessive and unreasonable, and is a detriment to complainant's property interests at Coney Island.

"That subsequent to Aug. 31, 1908, and since the rate of fare has been increased on week days, the real estate throughout the section where the increased rate of fare went into effect has materially diminished in valuation.

"That many residents of Coney Island who occupied apartments were compelled to move away on account of this increase of fare, as many of the people residing in the West Brighton section of Coney Island were people who traveled to and from Coney Island every day to their business and who could not afford to pay the increased rate of fare for transportation.

"That the people living in the West Brighton section have children who must attend school, and that many of these children, after they graduate from the public school at Coney Island, are compelled to ride to Brooklyn each week-day to attend the high schools in that borough.

"That for the past two years, and since the increase of fares went into effect, there have been more flats empty throughout the Coney Island section than at any other time prior to such increase of rate of fare. That it is the first time in many years that property owners throughout the Coney Island section have been unable to rent apartments.

"That your complainant, under the foregoing circumstances, respectfully asks this board that an order be issued to the Coney Island & Brooklyn Railroad compelling it to reduce its rate of fares from Coney Island to New York and New York to Coney Island, from 10 cents to 5 cents, except on Saturdays, Sundays and holidays."

The commission adopted a complaint order on July 13, directing the Coney Island & Brooklyn Railroad to answer within 10 days why it should not reduce its week-day fare to Coney Island from 10 cents to 5 cents.

Data Sheet of the A. S. & I. R. Transportation & Traffic Association

The committee on express and freight traffic of the American Street & Interurban Railway Transportation & Traffic Association has prepared data sheet No. 40, which is being sent to member companies over the signature of P. P. Crafts, chairman of the committee, with the request that the questions which it contains be answered and the sheet returned to B. V. Swenson, secretary of the association, as soon as possible, so as to be available for the 1909 convention. The information is to be regarded as strictly confidential and will appear in the tabulations in such a manner as to conceal its origin. The questions on the data sheet follow:

REVENUE FROM TRANSPORTATION.
CALENDAR YEAR, 1908.

Passengers	\$.....
Baggage .....	.....
Parlor, chair and special cars.....	.....
Total revenue.....	\$.....
Mail	\$.....
Express .....	.....
Milk .....	.....
Freight .....	.....
Switching .....	.....
Total revenue.....	.....
Miscellaneous transportation revenue.....	\$.....
Total revenue from transportation.....	.....

NOTE.—Do not include in above statement revenue from station and car privileges, parcel room receipts, storage, car service, telegraph and telephone service, rents of tracks and terminals, rents of equipment, rents of buildings and other property, power, or miscellaneous receipts, which items constitute revenue from operation other than transportation.

- Length of line (actual distance between termini).
- Miles single main track (owned and operated).
- Miles double main track (single track miles owned and operated).
- Miles total main track (single track miles owned and operated).
- Miles sidings used for freight purposes.
- Population served outside of terminals and large cities and towns.
- Population served including same.
- Passenger, baggage, parlor, chair and special car revenue per mile (length of line).
- Per cent of total revenue from transportation.
- Mail, express, milk, freight and switching revenue per mile (length of line).
- Per cent of total revenue from transportation.
- Total revenue from transportation per mile (length of line).
- Freight car-miles operated.
- Revenue from express, milk and freight hauled in freight cars per freight car-mile.

- Tons express, milk and freight hauled.
- Revenue per ton.
- Tons express, milk and freight hauled one mile.
- Revenue per ton mile.

OPERATING EXPENSES OF FREIGHT DEPARTMENT.

- Salaries of solicitors.
- Salaries of clerks.
- Salaries of other officers and office employees charged to freight department.
- Wages of conductors, motormen and other trainmen charged to freight department.
- Rent of building, lights and telephones, charged to freight department.
- Insurance and taxes.
- Books, forms, stationery, etc.
- Power. On what basis charged?
- Maintenance of freight equipment.
- Maintenance of track, roadway and overhead lines. On what basis charged?
- Damage account (amount). Per cent of revenue.
- Expense of wagon delivery, if any.
- Other charges to freight department (enumerate).
- Total.
- If you operate over tracks of other companies in cities, what annual rental do you pay for hauling freight over same?
- What is basis of rental?
- What annual charges, if any, do you pay cities and towns for privilege of hauling freight over streets?
- What is the basis of same?
- What is your investment in freight terminals, buildings, yards, rolling stock, etc., necessary for conduct of freight business?
- Do you apply the classification and distance tariff of the steam road classification committee for the territory in which your road is located, or do you apply your own classification and distance tariff?
- If the latter, what is your reason for so doing? (Please enclose classification and tariff.)
- Do you participate in joint rates with steam railroads?
- Do you participate in haul with steam railways on two or more locals?
- Do you rent privilege to steam railroad to operate over all or a part of your road on a wheelage or car mile basis?
- What railways?
- What is the basis of compensation to your road? (Please explain fully.)
- What equipment do you furnish if you participate in joint rates, or does steam railway furnish equipment?
- Do you haul freight trains by electric or steam locomotives?
- Your reason for so doing?
- Do you operate under contract with any of the old line express companies?
- What express companies?
- Do you permit express company to handle local business, i. e., originating at and destined to points on your road in addition to foreign business, or do you confine the express company wholly to foreign business?
- If the express company handles local business, how do you distinguish between express merchandise to be handled by it and freight merchandise to be handled by you?
- Do you carry express matter so handled on freight, express or passenger car, or any combination of same?
- How are you compensated by express company? (Please explain fully the basis of compensation, whether percentage of rates, tonnage, rental of cars and crew, or any other method. If for any reason you do not wish to divulge the rates paid by express company, please indicate the basis of compensation at least.)
- What competition do you have in your freight business?
- How do you meet such competition in rates, service, special inducements, etc.?
- What terminal facilities do you provide, i. e., yards, freight houses, etc.? Do you own all these terminals, or do you rent them? Please explain fully.
- What municipal or State restrictions prevent you from entering the freight and express business, or which are so burdensome as to prevent you from making a reasonable profit?
- Given the above condition, what action have you taken to eliminate such objectionable restrictions?
- Please give any further information which in your opinion will be valuable to member companies.

REMARKS:

Report of Wisconsin Commission on Traffic in Milwaukee

A program for the improvement of transportation in Milwaukee, designed to relieve the present congestion and looking toward permanent future convenience and facility in passenger traffic, has been outlined by the engineering department of the Railroad Commission of Wisconsin under the direction of Prof. W. D. Pence, engineer of the Railroad Commission, and R. W. Harris. The program suggests means for improvement of the service, both by act of the company and co-operative steps on the part of the company and public in general, involving changes in routing, additional cars, building new lines, various adjustments of incidents of operation, etc. This matter has been incorporated in a report which has been submitted to the commission by its engineer.

This investigation grew indirectly out of the complaint of the city of Milwaukee against the Milwaukee Electric Railway & Light Company relative to service and rates. In the formal hearings before the commission the conflicting evidence upon certain matters of a very technical nature rendered it practically impossible for the commission to reach an intelligent decision, hence the necessity for the independent field observations, which resulted in the above-mentioned report. These observations were carried out by a party of five men and covered a period of approximately six months. The report itself comprises 350 pages.

Two matters of technical importance, which have not heretofore been treated in such investigations, are those covering the determination of "comfortable load" and the promptness or alacrity of passengers in boarding cars. The latter matter was of such importance that corresponding

observations were made in a number of other cities, including Minneapolis, St. Paul, Duluth, St. Louis and Indianapolis.

With reference to the determination of "comfortable load," elaborate compilations covering observations of some 9000 cars at all hours of the day and at all important points of the system brought the engineers to the conclusion that the presence of "standing passengers" did not necessarily indicate overloading or an insufficient number of cars. It was demonstrated that a considerable number of passengers voluntarily stood up even when empty cars were available. Some interesting statistics on this point are given. The seating capacity of the ordinary car was 42 passengers. The results show that when the car contained from 5 to 14 passengers, 2 preferred to stand; 30 to 40 passengers, 6 stood; 35 to 39 passengers, 7 stood, and from 40 to 42 passengers, 8 preferred to stand. Thus, since the observations very clearly showed that eight persons preferred to stand when the car contained 42 passengers—that is, when every one could have had a seat—the comfortable load per car was fixed at 50 passengers, and this schedule was used throughout the program.

The observations in regard to the second subject—that of promptness—disclosed the fact that there is a certain sluggishness about the movement of traffic in Milwaukee that apparently might be corrected. Comparisons between Milwaukee and other cities previously mentioned are shown by the following table:

TIME IN SECONDS PER PASSENGER REQUIRED TO BOARD A CAR, WITH DIFFERENT NUMBER OF PASSENGERS BOARDING CAR AT SAME TIME.

	2	5	10	15	20	25
Indianapolis	1.75	1.25	1.00	0.95	0.91	0.90
St. Paul	2.20	1.56	1.15	1.05	0.97	0.98
St. Louis	2.60	1.58	1.15	1.00	0.96	0.97
St. Louis*	2.60	1.58	1.33	1.37	1.42	1.50
Minneapolis	3.20	1.75	1.25	1.05	1.00	0.98
Milwaukee	3.20	2.00	1.47	1.27	1.25	1.25
Duluth	4.00	2.00	1.54	1.10	1.00	1.00

*St. Louis refers to "pay-as-you-enter car."

The table shows that if more than 10 people board a car at once the time required is at present greater in the case of the "pay-as-you-enter" car than it is with the ordinary car, and this difference steadily increases with the number boarding the car.

An average of a large number of observations taken at the principal junction points in Milwaukee shows that a car is liable to be held up nine seconds due to a variety of causes. This, together with the time required to stop a car on signal, led the engineers to the conclusion that a 20-second headway was the fastest that could be maintained and have the cars run on schedule.

Freight Rights Granted.—The Springfield & Eastern Street Railway has been granted authority to carry baggage and freight in Monson by the Massachusetts Railroad Commission.

Arbitration in Texas.—The employees of the Beaumont (Tex.) Traction Company and the officers of the company have decided to submit to arbitration the differences between them.

Report in Waiting Room Case.—Upon the suggestion of the city of Worcester, the petition of the Board of Aldermen relative to the establishment of waiting rooms by the Worcester (Mass.) Consolidated Street Railway has been filed without prejudice by the Massachusetts Railroad Commission.

Inland Empire Booklet.—The Inland Empire System, Spokane, Wash., has issued a booklet describing places of interest in the panhandle of Idaho. It is printed in colors and contains several excellent half-tone illustrations of Cœur d'Alene and other towns located in that district. The publication contains 16 pages, but only one page and an insert map are devoted to the interests of the Inland Empire System.

Extension of Pay-As-You-Enter System in Buffalo.—The International Traction Company, Buffalo, N. Y., placed 12 pay-as-you-enter cars in service on its Buffalo lines on July 11, and has announced that eventually the entire system will be equipped with cars of this type. At present the International Traction Company is operating pay-as-you-enter cars successfully over the Niagara, Grant, Hoyt and Elmwood Avenue lines.

First Grade Crossing Hearing in Indiana.—The Railroad Commission of Indiana has received and filed the first petition under the new law asking for an order by the commission to eliminate a grade crossing. The petition was filed by the Pennsylvania Railroad, and seeks to compel the Indianapolis, Columbus & Southern Traction Company, Columbus, Ind., to eliminate the grade crossing between its line and that of the Pennsylvania Railroad, four miles south of In-

dianapolis. The commission set July 14 as the date for the hearing.

Accidents in Brooklyn.—Ten persons were hurt in a collision between a special race track train of the Long Island Railroad and a three-car train of the Brooklyn Rapid Transit Company at the Neck Road station of the companies at the Sheepshead Bay race track on July 9. The accident is said to have been caused by the failure of the engineer of the Long Island train to observe a signal that was set against him. In a collision between two cars of the Brooklyn Rapid Transit Company on July 11 on the Williamsburg Bridge seven persons were injured.

Mileage Tickets Issued by Buffalo & Lake Erie Traction Company.—The Buffalo & Lake Erie Traction Company, Buffalo, N. Y., on July 1 issued a 300-mile mileage book for \$5.25, which will be good for interstate business to and from any point on the line between Buffalo, N. Y., and Erie, Pa. The books are transferable, and can be used for any number of people when the person to whom the book is issued is a member of the party offering the book for passage. A commutation book has also been issued which will be sold at the rate of 1¼ cents per mile or any fraction thereof for interstate travel. It will be good for 54 single trips, but must be used within 30 days and is not transferable. J. C. Calisch, general manager of the company, states that there is considerable demand for this class of ticket, and he thinks that it will prove advantageous to the company and to the public.

Bonuses for Employees in Washington, D. C.—The Capital Traction Company, Washington, D. C., has distributed \$1,600 in bonuses to 226 of its motormen and conductors for efficient service during the past year. The awards amount to \$50, \$75 and \$100 each, according to the length of service of the men. Employees are divided into three classes: Class A, consisting of those who have served the company for two years; class B, those who have served the company for five years, and class C, those who have served the company for 10 years. The records which are kept show a minimum of accidents or other troubles due to the action or non-action of the conductors and motormen. It is from these records that the awards are made, the selection of honor men being in the hands of a board, consisting of the president, the second vice-president, the general manager and the superintendents of the five divisions of the company.

Folder of the Inter-Urban Railway.—The Inter-Urban Railway, Des Moines, Ia., has issued a 36-page folder in which the attractions afforded along the line are described and illustrated. The company has just inaugurated a new hourly service between Des Moines and Colfax, a famous health resort. Trains leave Des Moines at 8:30 a. m. and 5:30 p. m., returning from Colfax at 10:05 a. m. and 7:05 p. m. The folder also contains information regarding rates for excursions, the season schedule of the Des Moines baseball club and a list of events for the season 1909. Illustrations are shown of Beaver Park, on the Beaver division, about 27 miles from Des Moines. This park is maintained by the company for the exclusive use of its patrons, to whom admission to it is free. Panoramic views are presented of Fort Des Moines, Des Moines and Ingersoll Park. On the back cover there is a map showing the route of the road. Frank S. Cummins, Des Moines, is traffic manager.

Hudson & Manhattan Railroad and Pennsylvania Railroad to Interchange Traffic.—It is announced that arrangements have been entered into between the Pennsylvania Railroad and the Hudson & Manhattan Railroad, operating under the Hudson River between New York and New Jersey, whereby passengers on the Pennsylvania Railroad will be transferred to the lower tunnel of the Hudson & Manhattan Railroad and transported to New York when that line is placed in operation on July 19. The ferry boat service of the Pennsylvania Railroad between Jersey City, Cortlandt Street, New York, and between Jersey City and Desbrosses Street, New York, and Jersey City and Twenty-third Street, New York, will be continued, but it is said that during the non-rush hours fewer boats will be run in the future because of the diversion of traffic to the tunnels. It will be possible after July 19 to purchase tickets to all points on the Pennsylvania Railroad at the ticket windows of the Hudson & Manhattan Railroad in the Hudson Terminal Buildings, New York, but for the present at least baggage will be checked only from the ferry stations. Hereafter the timetables of the Pennsylvania Railroad will give four leaving times for trains from New York—the leaving time from the Hudson Terminal Buildings as well as from Twenty-third Street, Desbrosses Street and Cortlandt Street.

Time Table Issued by the Chicago & Milwaukee Electric Railroad.—The Chicago & Milwaukee Electric Railroad, Chicago, has published a time table giving its summer

schedule, which went into effect June 17, 1909. Eight limited trains, having cafe, parlor and observation cars, are operated daily between Milwaukee and Evanston. Meals are served a la carte on all limited trains. General information regarding the rate of fare, redemption of tickets, baggage regulations and special service is given in the first half of the time table. The publication also contains a list of cities under which are centered the principal railroad and steamship connections, theaters, public parks, amusement resorts, places of interest, hotels, health resorts, lakes, rivers, clubs, universities and colleges. A special theater service is operated between Chicago and Milwaukee, the "Milwaukee Special" leaving Evanston for Milwaukee and intermediate points at 12:15 a. m., and the "Chicago Special" leaving Milwaukee for Evanston and intermediate points at 11:30 p. m. The time table is concluded with a list of places that can be reached between Chicago and Milwaukee, the time of departure of the trains and the rate of fare between points. A feature of the booklet is a blank sheet for memoranda after every page of text. The front cover is illustrated with a picture of a three-car train in colors, and on the back cover is printed a map of the route of the road, showing connections with other interurban lines. E. H. Vivian, Highwood, Ill., is traffic manager of the company.

Decision in Albany Freight Case.—The Public Service Commission of the Second District of New York has rendered its decision in the complaint of Philo N. Bebee and other Albany merchants against the Electric Express Company and the United Traction Company, Albany, as to the rates charged for transportation of express matter between Albany and Schenectady in the former case, and Albany and Troy in the latter case. In the Electric Express Company matter the commission decides that the complaint be held not sustained so far as the 100 lb. rates between Albany and Schenectady are concerned, but that on and after Aug. 1, 1909, the Electric Express Company desist from charging its present minimum rate between Albany and Schenectady and put in operation a minimum schedule which shall not exceed for all classifications, no wagon service, one wagon service and two wagon service, 15 cents on packages of 50 lb. or less, on packages of over 50 lb. 25 cents, and that these minimum rates be inclusive of any charges whatsoever for picking up and delivering packages. In the case of the United Traction Company as to rates between Albany and Troy the commission holds that the complainants have not sustained their case so far as the 100 lb. rates between Albany and Troy are concerned, but orders that on and after Aug. 1, 1909, it shall put in operation between Albany and Troy a minimum schedule which shall not exceed for all classifications, no wagon service, one wagon service and two wagon service, 15 cents on packages of 50 lb. or less, 20 cents on packages over 50 lb., and that the minimum rate named shall include any charges whatsoever for picking up and delivering packages.

Report of the Montreal Benefit Association.—The Montreal (Que.) Street Railway Mutual Benefit Association has issued its sixth annual report for the year ended April 30, 1909. It shows that 554 members were disabled through sickness or injury in 1908-9, as compared with 546 in 1907-8; that 1318 visits were made by physicians to disabled members during 1908-9, as compared with 1114 for 1907-8; that 6385 consultations were given by physicians to disabled members in 1908-9, as compared with 6828 for 1907-8; that 5367 prescriptions were issued for 1908-9, as compared with 5661 for 1907-8; that \$9,457 was paid for sickness and injury in 1908-9, as compared with \$7,321 for 1907-8; that \$1,697 was paid for medicine in 1908-9, as compared with \$1,707 in 1907-8; that \$225 was paid for pensions in 1908-9, as compared with \$161 in 1907-8, and that \$6,566 was paid for death and burial insurance in 1908-9, as compared with \$4,791 in 1907-8. The association was organized on Oct. 1, 1903, and was incorporated in 1904. The statement is made in the report that \$27,192 has been paid out in death benefits since the organization of the association and that \$44,511 has been paid for benefits in cases of sickness and injury. In addition to this there is the amount paid in pensions, medicine, medical attendance, etc. The accumulated reserve fund of the association as shown in the report is \$54,237, divided as follows: Reserve for sickness and injury fund, \$3,808; reserve for death and burial fund, \$14,732; reserve for pension fund, \$31,909; reserve withdrawal fund, \$3,787. The report acknowledges a special Christmas donation from the Montreal Street Railway of \$3,000, which makes the total contributions received from the company \$13,910. This amount, and \$13,008 received in fees and dues from the members and \$10,395, the proceeds of a picnic to the employees and interest on investments and bank deposits, made the total revenue for the year \$37,314. Against this were charged total expenses of \$24,400, leaving a surplus of \$12,913.

Personal Mention

Mr. E. M. Bassett, of the Public Service Commission of New York, First District, is visiting Buffalo, Chicago, Milwaukee, Minneapolis and St. Paul to inspect the public utilities in those cities, particularly the electric railways.

Mr. W. R. Willcox, chairman of the Public Service Commission, of the First District of New York, sailed for Europe on the *Mauretania* on July 15. Mr. William McCarrroll, of the commission, will act as chairman during Mr. Willcox's absence.

Mr. C. H. Johnson has been appointed superintendent of the railway department of the Bangor Railway & Electric Company, Bangor, Me., to succeed W. H. Snow, deceased. Mr. Johnson entered the employ of the Bangor Railway & Electric Company in July, 1895, as a conductor and subsequently served as an inspector for the company. For the last four years, he has acted as assistant superintendent of the company.

Mr. J. O. Harrison has been appointed superintendent of motive power of the Fort Dodge, Des Moines & Southern Railway, Boone, Ia., to succeed Mr. H. B. Sutton. Mr. Harrison was formerly connected with the Evansville, Suburban & Newburgh Railway and previous to that was connected with the Evansville Street Railway, which was taken over by the Southern Indiana Traction Company. Mr. Harrison has also had considerable experience with steam railroads. For six years, he served as an engineer on the Louisville & Nashville Railroad and for four years was roundhouse foreman for that company. He is the inventor of a fender.

Mr. George Kuemmerlein, Jr., has been appointed superintendent of transportation of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Mr. Kuemmerlein entered the employ of the Milwaukee Street Railway, which was succeeded by the Milwaukee Electric Railway & Light Company, on Sept. 15, 1893, and has served with the company and its successor since that time in turn as clerk, dispatcher, assistant superintendent of transportation and acting superintendent of transportation. Mr. Kuemmerlein's father, Mr. G. M. Kuemmerlein, has been identified with the Milwaukee Electric Railway & Light Company and its predecessors for 35 years. Mr. George Kuemmerlein, Jr., is, of course, thoroughly familiar with conditions in Milwaukee, on account of his long connection with the company.

Mr. W. A. Gibbs, district manager of the Ohio Electric Railway, with headquarters at Springfield, Ohio, has resigned from the company, effective on Sept. 1, 1909. Mr. Gibbs is a New Englander by birth and a graduate electrical engineer. He was appointed to the Zanesville Light & Railway Company, Zanesville, Ohio, in 1905, and was made manager of the Columbus, Buckeye Lake & Newark Traction Company when the property was acquired by the Schoepf interests in 1906. In 1907 the properties of the Schoepf interests in Ohio were consolidated as the Ohio Electric Railway and Mr. Gibbs was made district manager with jurisdiction over the Buckeye Lake and Newark line, which became the eastern division, and the lines of the central division. In the fall of 1908 Mr. Gibbs had his jurisdiction extended over the Dayton and Richmond & Dayton and Union City lines of the Ohio Electric Railway, succeeding Mr. F. J. J. Sloat, resigned.

Mr. Paul H. Smith has been appointed superintendent, electrical engineer and purchasing agent of the Pittsburgh & Butler Street Railway, Pittsburgh, Pa., to succeed Mr. W. M. Kessler as superintendent and Mr. G. B. Nicholl as electrical engineer. Mr. Smith was graduated from Lehigh University with the degree of electrical engineer in 1902 and for the last seven years has been connected with the Westinghouse Electric & Manufacturing Company. He served for this company at first in the New York territory and later as district engineer of the company in Cleveland, where he had charge of engineering work in connection with a number of interurban electric railways in that section. Mr. Smith was subsequently made district engineer of the Westinghouse Electric & Manufacturing Company for the southwest with headquarters in St. Louis, and was appointed to the Pittsburgh & Butler Street Railway from this position. He has entire charge of operation, maintenance of way, and powerhouses and repair shops of the Pittsburgh & Butler Street Railway.

Mr. H. H. Roseman, whose appointment as general traffic manager of the Illinois Traction System, Peoria, Ill., was noted on page 94 of the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909, was born at Vincennes, Ind., on July 7, 1869, and was educated at the Vincennes University. When 15 years old he took a position as clerk to the master mechanic of

the Baltimore & Ohio Southwestern Railroad at Vincennes. In 1886, Mr. Roseman moved with his parents to Evansville, Ind., and became connected with the Evansville & Terre Haute Railroad as messenger at the freight offices. Mr. Roseman continued through various railroad positions and in 1894 was appointed assistant to the receiver of the Evansville & Richmond Railroad, and in 1895 he was made general passenger and freight agent and auditor and treasurer of that road. In 1897 the Evansville & Richmond Railroad was reorganized as the Southern Indiana Railway and Mr. Roseman was made general traffic manager of the company which position he held until March, 1905, when he entered the employ of the Chicago, Cleveland, Cincinnati & St. Louis Railroad in charge of the freight traffic on the Cairo Division, from which he resigned to enter the employ of the Illinois Traction System.

Mr. Hugh M. Wilson, formerly president of the Wilson Company, publisher of the *Electric Railway Review* and *The Railway Age* until June 1, 1908, was on July 3 elected a director and vice-president of the Barney & Smith Car Company, Dayton, O., and will enter on the duties of this office Aug. 1. Mr. Wilson has only recently returned to the United States after nearly a year spent in foreign travel. He was born June 29, 1866, at Jacksonville, Ill., and is a graduate in the class of 1887 of Illinois College, by which, in 1904, he was given the honorary degree of M.A. Soon after graduation he entered newspaper work, first with the Jacksonville *Daily Journal*, then with the Minneapolis *Evening Star*, and later with the *Mississippi Valley Lumberman* and the *North Western Railroader*.



Hugh M. Wilson

He became connected with the latter paper in May, 1891, as associate editor, but also devoted a great deal of time to the business side of the work, and on Sept. 15, 1891, when the *North Western Railroader* was combined with *The Railway Age* he became secretary and treasurer of the consolidated paper. Subsequently he was appointed manager and in 1899 was elected president of *The Railway Age*. During the International Railway Congress in 1905 the daily issue of this paper was made the official journal of the congress, and for its successful work in reporting the proceedings of these meetings Mr. Wilson was decorated a Chevalier of the Order of Leopold by the King of the Belgians. In May, 1906, he organized the Wilson Company, and the same month purchased the *Street Railway Review* from the Kenfield Publishing Company. The following July this paper was renamed the *Electric Railway Review*, and the following January it was changed from a monthly to a weekly. The Wilson Company continued to publish the *Electric Railway Review* until June, 1908, when it was purchased by the McGraw Publishing Company and consolidated with the *STREET RAILWAY JOURNAL*. Mr. Wilson always took an active part in both the editorial and business departments of the papers with which he was connected, and for two years served as a member of the executive committee of the American Street & Interurban Railway Manufacturers' Association.

OBITUARY

William Forbes Emerson, who in April, 1909, was appointed by Stone & Webster, Boston, Mass., to take charge of their interests in Chicago, died in Chicago on June 24. Mr. Emerson was born in Concord, Mass., 25 years ago and was graduated from Harvard with the class of 1906. He was a son of Dr. Edward W. Emerson, Concord, and a grandson of Ralph Waldo Emerson. He entered the employ of Stone & Webster in October, 1906, and since March 1, 1907, had been connected with the securities department of the firm.

The Public Service Commission of the First District of New York has sent to the Board of Estimate and Apportionment a letter asking that a special committee consider moving platforms during the summer months. The proposition the commission has in mind is for a moving platform subway as submitted by E. P. Ripley, president of the Atchison, Topeka & Santa Fe Railroad, and Max E. Schmidt, president of the Continuous Transit Securities Company, to run from Tenth to about Forty-second Street.

Construction News

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

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

RECENT INCORPORATIONS

Peninsular Railway, San José, Cal.—Incorporated under the laws of California as the successor to the Peninsular Railroad, San José & Los Gatos Interurban Railway and the Santa Clara Interurban Railway, which have been consolidated. This company will comprise all the present and contemplated railway systems on the San Francisco peninsula from that city to San José, via intermediate towns. The total estimated length of the railways controlled by this company is 222 miles. Capital stock, \$12,000,000. Incorporators: J. T. Burke, Paul Shoup, C. B. Seger, P. F. Dunne and F. E. Chapin.

Springfield, Beardstown & Quincy Railway, Petersburg, Ill.—Chartered to construct an electric railway from Springfield to Quincy via Beardstown. Capital stock, \$25,000. Incorporators: Henry Colly, Robert Bone, Charles W. Houghton and John Hurie, Petersburg; George Harnsberger, Springfield; W. T. Gates, St. Louis, Mo. [E. R. J., July 3, '09.]

***Hannibal & Jefferson City Interurban Traction Company, Mexico, Mo.**—Incorporated to build an interurban railway from Jefferson to Hannibal, 120 miles. Capital stock, \$4,620,000. Incorporators F. T. Hodgdon and C. H. Northam, Hannibal; J. O. Allison, New London; S. C. Gill, Perry; C. C. Heizer, Santa Fe; J. A. Botts, Moline; S. J. Buckner, Judge Mathias Crum, Mexico; Judge T. F. Murry, Hereford; J. A. Stewart, Columbia; J. H. Atkinson, Fulton.

Clarion & East Brady Electric Railway, Clarion, Pa.—Application for a charter has been made by G. E. Arnold, R. M. Werner, T. S. Arnold, I. N. Langham and E. W. Witherell to build an electric railway from Clarion to East Brady via Sligo and Rimersburg, a distance of 25 miles. [E. R. J., April 24, '09.]

***Cairo & Nashville Interurban Railway, Nashville, Tenn.**—Incorporated in Tennessee to build an electric railway from a point on the Kentucky and Tennessee line in Obion County through Paris, into Nashville. Capital stock, \$25,000. Incorporators: T. C. Rye, J. C. Sweeney, D. B. Sweeney, J. C. Sweeney, Jr., and C. E. Steaks.

***Russell-Prater Railway, Bessie, Va.**—Incorporated in Virginia to build a railway 12 miles long in Dickenson County to connect with the Carolina, Clinchfield and Ohio Railway. Capital stock, \$25,000. Incorporators: Leon Isaacson, Brooklyn, N. Y., president; C. M. Crawford, Ironton, Ohio, secretary; J. E. Hager, B. E. Whitman and C. F. Hager, Ashland, Ky.

***Parkersburg & Pocatigo Valley Railroad, Parkersburg, W. Va.**—Incorporated to build an electric railway from Parkersburg to or near Charleston. Capital stock, \$5,000. Incorporators: C. P. Craig, E. C. Gooden and Jos. Williams, St. Marys; R. E. Bills and Jno W. Dudley, Jr., Parkersburg.

FRANCHISES

Oakland, Cal.—Application to the City Council for a franchise has been made by the South Pacific Coast Railroad to build an electric railway from its Webster Street terminal to San Pablo Avenue at Twenty-first Street.

San Diego, Cal.—The City Council has granted to the San Diego Electric Railway an extension of its franchise to Jan. 1, 1910 to complete its railway on B Street to the San Diego Bay.

Elkhart, Ind.—The City Council has granted to the St. Joseph Valley Traction Company an extension of its franchise, until Oct. 4, in which to complete its East Jackson Street line into the city. [E. R. J., April 3, '09.]

Boone, Ia.—E. E. Hughes, president of the Boone, Webster City & Interurban Railway, has been granted a franchise for an electric railway in Boone. [E. R. J., Jan. 16, '09.]

West Orange, N. J.—The Board of Freeholders has granted to the Orange Mountain Traction Company a 50-year franchise to extend its tracks on Northfield Avenue between Cable Road Avenue and Walker Road. [E. R. J., June 5, '09.]

***Clovis, N. M.**—E. J. Howard, J. D. Hammett and A. R. Hammett, Moberly, Mo., have applied to the City Council for an electric railway franchise.

New York, N. Y.—Justice Ingraham, in the Appellate Division of the Supreme Court, has handed down a decision upholding the Board of Estimate in granting a franchise

to the South Shore Traction Company to build and operate a street railway over the Queensboro bridge. The decision was a reversal of the refusal by the Public Service Commission to confirm the franchise granted to the South Shore Company by the Board of Estimate.

***Troy, N. Y.**—In accordance with the action of the Court of Appeals in the case of the Trojan Railway vs. the United Traction Company and the City of Troy, Mayor Elias Mann, of Troy, has awarded the franchise for a street railway in Lansingburg to Joseph A. Powers, who has transferred his title to the Trojan Railway.

Columbus, Ohio.—The Indiana, Columbus & Eastern Traction Company has applied to the City Council for a franchise to extend its street railway on Town Street between Third Street and Scioto Street and to connect with the main tracks at Third and Scioto Streets, where it proposes to construct a terminal station.

Wilkes-Barre, Pa.—The Wilkes-Barre & Wyoming Valley Traction Company has been granted permission by the City Council to extend its track on Scott Street. It is the intention of the company to construct a railway between Wilkes-Barre, Parsons, Miner's Mills and Hudson.

***Florence, S. C.**—P. A. Willcox, John L. Barringer, Wm. J. Brown and S. S. Ingram have applied to the City Council for a franchise to build a street railway system in Florence. If the franchise is granted a park at Black Creek is proposed.

***Chattanooga, Tenn.**—The County Court has granted to Bowdre Brown, representing a syndicate of capitalists, franchises to build electric railways on streets in the suburbs around Chattanooga. These franchises include a railway to East Chattanooga via Harrison Pike, a railway to Rossville, Ga., another to St. Elmo and a fourth railway to Alton Park and Mountain Junction, connecting with the proposed incline railway up Lookout Mountain.

Seattle, Wash.—D. C. Conover and E. P. Moran have been granted a franchise to construct an electric railway from Bellevue to Lake Sammamish. [E. R. J., April 17, '09.]

***Seattle, Wash.**—J. R. McLaughlin and Paul C. Murphy have applied to the County Commissioners for a franchise to construct an electric railway over certain country roads to Laurelhurst. It is planned by the applicants to build an electric railway along the west and north shores of Union Bay, using Twenty-third Avenue to enter the city, and to connect with the Seattle Electric Company.

TRACK AND ROADWAY

Birmingham & Edgewood Electric Railway, Birmingham, Ala.—This company, which has been organized to build an electric railway from the end of the South Highlands line to Red Mountain, has completed preliminary arrangements and will soon award the contracts. All necessary franchises and right-of-way has been secured. It will be about 3½ miles long and will have a grade less than 6 per cent. The Board of Revenue has appropriated \$10,000 to be used in cutting through Red Mountain, according to plans that have been prepared by the company. G. T. Brazleton, secretary. [E. R. J., June 5, '09.]

Northern Electric Railway, Chico, Cal.—This company is making preparations for an extension of its railway from Hamilton City to Yuba City by way of Princeton and Colusa.

Pacific Electric Railway, Los Angeles, Cal.—This company has recently opened the new 10-mile line connecting Santa Ana and Huntington Beach. A 45-minute service will be maintained.

Denver-Greeley Electric Railway, Greeley, Col.—It is announced that this company has commenced work in Greeley on its electric railway from Denver to Greeley. J. D. Houseman, general manager. [E. R. J., June 19, '09.]

Atlanta, Griffin & Macon Electric Railway, Atlanta, Ga.—This company has completed its surveys and has secured its right-of-way for the electric railway between Atlanta and Macon via Griffin. Franchises have been secured from every city through which the railway will pass. Power for the railway will be furnished by the Central Georgia Power Company, which is completing the construction of a dam and power plant on the Ocmulgee River, which will have a capacity of 21,000 hp. The Georgia Securities Company has been organized as a holding company for the railway. [E. R. J., Feb. 13, '09.]

Belleville & Interurban Railway, Belleville, Ill.—This company has filed with the Union Trust & Savings Bank, East St. Louis, Ill., as trustee, a mortgage to secure an issue of \$100,000 first mortgage 6 per cent gold bonds. The purpose of the company is to build a 10-mile electric railway from Belleville to Smithton. Jacob Gundlach and Thomas A. Bell, St. Louis, Mo., are said to be interested in this project. [S. R. J., Nov. 9, '07.]

Illinois Traction System, Champaign, Ill.—The City Council of St. Louis, Mo., has approved the \$100,000 bond of this company to guarantee the careful observance of regulations relating to streets crossed or used by its railway.

***Fairfield, Ill.**—At a meeting of the business men of Fairfield and Burnt Prairie, Ill., held in Fairfield on July 5, the subject of building an electric railway from Carmi to Fairfield by way of Burnt Prairie, a distance of 25 miles, was favorably discussed. George W. Brown, Burnt Prairie, who is said to be backed by Kansas City capitalists, is interested.

***Yorkville & Morris Electric Railroad, Yorkville, Ill.**—This company has been organized to build an electric railway from Yorkville to Morris, 22 miles, and will soon let the construction contracts. The survey is already made and most of the right of way obtained. The company is desirous of making financial arrangements with some company regarding first mortgage bonds. H. G. Palmer, Aurora, president.

Galesburg & Rock Island Traction Company, Rock Island, Ill.—This company has filed for record at Monmouth, a mortgage to the Empire Trust Company, New York, N. Y., as trustee, to secure an authorized issue of \$1,500,000 of 40-year 5 per cent bonds, dated May 1, 1909. The proposed electric railway will be about 41 miles in length, connecting Galesburg and Rock Island. [E. R. J., May 22, '09.]

Indianapolis, Cloverdale & Vincennes Traction Company, Indianapolis, Ind.—E. M. Bowman, president of this company, announces that the directors have let a contract to J. J. Burns & Company, Chicago, for the construction of the proposed railway surveyed from Indianapolis to Vincennes by way of Mooresville, Eminence, Cloverdale, Worthington and Linton. It is estimated to cost \$18,000 a mile. [E. R. J., June 27, '08.]

Wabash & Northern Traction Company, Warsaw, Ind.—J. A. Barry, who is interested in this company, which proposes to build an electric railway from Warsaw to Wabash, Ind., reports that the preliminary work for building this line will soon be begun at Warsaw. The franchise granted to Mr. Barry in Warsaw calls for the completion of tracks over the streets in Warsaw and for 5 miles south by Jan. 1, 1910. [E. R. J., May 29, '09.]

Des Moines, Winterset & Creston Electric Railway, Des Moines, Ia.—This company has awarded to the Engineering Construction & Securities Company, 171 La Salle Street, Chicago, Ill., the contract for the engineering and construction of an interurban railway from Creston to Des Moines, extending through Macksburg and Winterset. An engineering corps will be put in the field during the next few days. [E. R. J., July 3, '09.]

Atchison Railway, Light & Power Company, Atchison, Kan.—This company is having surveys and estimates made on 5½ miles of extension of its street railway in Atchison. J. W. Waggener, general manager, and Fred. Giddings, engineer.

***Paducah, Ky.**—William Kershner, vice-president and general manager of the American Engineering Company, Indianapolis, has made the people of Golconda, Unionville, Brookport, Metropolis and Joppa, Ill., a proposition to build an interurban railway through these towns, to extend from Golconda to Joppa. It is estimated that the line would be 60 miles long and that it would cost \$20,000 per mile. He asks the citizens to raise 25 or 40 per cent of the cost of construction.

Arkansas Valley Interurban Railway, Wichita, Kan.—J. B. Hodgson, constructing engineer, has been directed by this company, to begin at once the preliminary work of surveying the proposed electric railway which is to connect Wichita with Newton and Hutchinson, as well as Burton and Valley Center. [E. R. J., June 12, '09.]

Battle Creek, Coldwater & Southern Railway, Battle Creek, Mich.—It is stated that this company is to let contracts during the summer for building its railway from Battle Creek southeast to Coldwater, a distance of 28 miles. Surveys and financial arrangements have practically been completed. C. E. Flynn, president of the Conneaut & Erie Traction Company, Erie, Pa., president. [E. R. J., Feb. 20, '09.]

Interstate Railway, Kansas City, Mo.—On July 9, the Circuit Court of Jackson County, Mo., granted a restraining order, enjoining the Geo. Townsend-C. F. Enright Syndicate and the Missouri River & Cameron Railroad and their agents and associates from attempting to build a road or in any manner interfering with or trespassing upon the right-of-way of the Interstate Railway, which last-mentioned company is preparing to build a double-track electric interurban railway between Kansas City and St. Joseph.

The Interstate Railway has already secured about 80 per cent of the right-of-way, and is preparing to begin construction this month. **S. B. Martin**, secretary. [E. R. J., May 15, '09.]

***Hannibal & Jefferson City Interurban Traction Company, Mexico, Mo.**—This company has been organized for the purpose of building an interurban railway from Jefferson City to Hannibal by the way of Columbia, Mexico and Perry, with branches to Fulton and other points in Callaway County. It has taken over the interests of the Mexico, Santa Fe & Perry Traction Company, which was incorporated over a year ago to build an electric railway between Mexico and Perry. The contract for the construction of the proposed line has been awarded to the Missouri Engineering Company, St. Louis, a newly organized corporation, with a capitalization of \$100,000, which is headed by De Groot Van Baekeman, representing the James Stewart Construction Company, New York, N. Y. It is the purpose of the construction company to begin work at once. The line will be 120 miles long, 103 miles of which is located and ready for construction. The sum of \$10,000 per mile has been subscribed and 96 per cent of the right-of-way has been purchased and the deeds therefore recorded. Franchises have been secured in Columbia, Fulton, Mexico, Santa Fe, Perry, Center, New London and Hannibal, while an ordinance for a franchise granting the use of the streets will be introduced at the next meeting of the Jefferson City board. The motive power has not yet been decided upon.

Hannibal & Northern Missouri Railroad, Palmyra, Mo.—This company was recently organized under the laws of Missouri to build an electric railway from Hannibal to Kirksville, Mo., by way of Palmyra. The line when completed will be practically 100 miles long. It is reported that E. P. Roberts, of the Roberts & Abbott Company, Cleveland, Ohio, has made a personal investigation of the conditions and has secured a contract for doing the engineering work on this proposed railway. A corps of engineers is said to have started making the preliminary surveys for the line. Officers: Frank W. Latimer, president and treasurer; Nathaniel Board, vice-president; Joseph W. Latimer, secretary. [E. R. J., July 10, '09.]

Butte (Mont.) Electric Railway.—This company will commence, at once, to construct about 2 miles of extensions on its railway system in Butte. One branch will extend over Oregon Avenue and the other will extend to East Meaderville. J. R. Wharton, Butte, manager.

Brooklyn Rapid Transit Company, Brooklyn, N. Y.—This company has applied to the Public Service Commission for permission to change its cable railway running from Borough Hall to the Wall Street Ferry to overhead trolley.

Utica (N. Y.) Southern Railroad.—This company has applied to the Public Service Commission of the Second District for permission to increase its capital stock from \$600,000 to \$1,000,000, the \$400,000 increase to be preferred stock, and for authority to issue \$968,800 capital stock, of which \$568,800 is to be common stock; also for consent to issue a mortgage for \$1,820,000 and for authority to issue an equal amount of bonds to be secured by this mortgage; also for permission to extend the route of its proposed electric railway from Hamilton to Norwich. E. H. Risley, Utica, secretary. [E. R. J., June 26, '09.]

Muskingum & Morgan Railway, Light & Power Company, Zanesville, Ohio.—William H. Pierpoint, secretary, confirms the report that this company will build an electric railway from Zanesville to McConnellsville via Duncan Falls, Philo, Gaysport and Rokeby. The company expects to furnish power for lighting. Capital stock, \$10,000. Officers: Andrew McDonald, Pittsburgh, Pa., president; John J. Adams, vice-president, and Rufus C. Burton, treasurer, Zanesville. [E. R. J., July 10, '09.]

***Nipissing Central Railway, Cobalt, Ont.**—This company, which has been chartered to build an electric railway from Cobalt to Haileyburg, has awarded the building contract to the Nova Scotia Construction Company, Sydney, N. S. The proposed railway is intended to connect eventually with North Bay. Work is to be started at the Cobalt end.

Port Arthur & Fort William Electric Railway, Port Arthur, Ont. (Municipal).—The City Council has decided to build an extension of its street railway and bids will soon be asked for construction material. W. P. Cooke, chairman.

***Lebanon, Ore.**—It is reported that the Mealey Brothers, Foster, will soon undertake the construction of an electric railway from Cascadia to Lebanon. It is also proposed to extend to Scio, Stayton and Salem.

***Pendleton, Ore.**—It is stated that the County Farmers' Union has decided to build an electric railway to the Columbia River, terminus to be either at Cold Springs or at

Umatilla, line to be from 20 to 40 miles long. A committee was appointed to investigate rights of way and other matters, to report in two weeks' time.

***Ellwood City, Pa.**—It is stated that the construction work of the proposed street railway from Ellwood City to Beaver Falls, 12 miles, will be started during the summer. A bridge is to be built across the Beaver River at a cost of \$75,000. Rights of way have been practically secured and financial matters have been arranged. H. W. Hartman, Ellwood City, promoter.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.—It is reported that this company, which connects with the Hagerstown Electric Railway at Shady Grove, will begin during the summer the construction of a 12-mile extension from Chambersburg to Shippensburg via Red Bridge, where it proposes to establish a park. The company also has under consideration plans for the building of an extension of the railway from Pen-Mar to Blue Ridge Summit via Lake Royer.

Brookings & Sioux Falls Railway, Brookings, S. D.—It is reported that this company, which is building a 65-mile electric railway from Brookings to Sioux Falls, is planning to extend it through to Bushnell. About 16 miles are ready for track. Neal Stewart, president.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company has opened its extension from Milwaukee to Burlington.

Sparta-Melrose Electric Railway & Power Company, Sparta, Wis.—The second grading contract of this proposed railway between Sparta and Melrose has been awarded to Brogan & Hayes, Green Bay. The contract includes a bridge over Black River, 1000 ft. long and several smaller bridges. [E. R. J., May 29, '09.]

SHOPS AND BUILDINGS

Tampa (Fla.) Electric Company.—This company is now installing an automatic sprinkler system at the West Jackson Street storerooms. The system is the Grinnell automatic sprinkler equipment with variable pressure alarm valve and alarm gong, and is to be connected with a low-duty pump and the city water mains.

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.—This company is said to have selected a site at Third Street and Main Street, Mishawaka, on which to erect an interurban railway station.

Michigan United Railways, Lansing, Mich.—The contract for constructing the new interurban depot and substation at Mason of this company has been awarded to M. A. Mahoney, Lansing. The building will be built of brick with cut stone trimming and a reinforced concrete roof. It will be one story high and the tower two stories. The dimensions of the building are to be 24 ft. x 66 ft., and the tower 20 ft. x 24 ft.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—This company has awarded to F. B. Burness, Kansas City, Mo., the contract for a two-story car house to be built at Tenth Street and Pierce Street. Construction will be started within two weeks. The building will be of reinforced concrete construction and will cost \$150,000.

Northern Texas Traction Company, Fort Worth, Tex.—This company is about to begin work on its car house in Fort Worth, which is to be enlarged. New tracks will be laid to connect with the building. The company also expects to build a one-story brick station in Dallas, to cost, it is estimated, about \$15,000.

POWER HOUSES AND SUBSTATIONS

Chicago, Ottawa & Peoria Railway, La Salle, Ill.—This company is about to increase the capacity of its power plant. Two 400-hp tube boilers will be installed.

Northern Texas Traction Company, Fort Worth, Tex.—This company is installing at its Handley power house a complete sprinkler system, rewiring the plant and putting new concrete floors in parts of the building.

Big Bend Transit Company, Spokane, Wash.—This company, which proposes to build an electric railway along the Spokane River, from Spokane to the Columbia River steamboat landing, has just completed an extensive survey of the river and site for a 60-ft. dam under the direction of L. F. McCoy, engineer. The Narrows will be used as a power site.

Northwestern Gas & Electric Company, Walla Walla, Wash.—This company has placed an order with the Allis-Chalmers Company, Milwaukee, Wis., for a 1000-kw steam turbine.

Kenosha (Wis.) Electric Railway.—This company has placed an order with the Allis-Chalmers Company, Milwaukee, for a 300-kw steam turbine.

Manufactures & Supplies

ROLLING STOCK

Detroit (Mich.) United Railways has requested proposals for 50 pay-as-you-enter cars.

Texarkana Light & Traction Company, Texarkana, Ark., is making inquiries for 6 single-truck city cars.

Chicago (Ill.) Railways is preparing specifications for rebuilding 324 of its St. Louis type of cars for pay-as-you-enter operation.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, ordered the 7 cars reported in the *ELECTRIC RAILWAY JOURNAL* of July 3, 1909, from the Niles Car & Manufacturing Company, Niles, Ohio.

Goldsboro (N. C.) Traction Company, which is completing 2½ miles of line in Goldsboro, is in the market for at least 2 cars and desires quotations on both open and closed, single-truck cars and trailers.

Grand Junction & Grand River Valley Railway, Colorado Springs, Col., has purchased from the Colorado Springs & Interurban Railway the equipment for which it was recently reported in the *ELECTRIC RAILWAY JOURNAL* to be in the market.

Interborough Rapid Transit Company, New York, N. Y., placed the order for 170 trailer trucks and 190 motor trucks, mentioned in the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909, with the American Locomotive Company and not with the American Car Company, as was stated.

Southern Pacific Railroad, Los Angeles, Cal., which company was reported in the *ELECTRIC RAILWAY JOURNAL* of Dec. 5, 1908, as planning to purchase 80 or more large electric cars for operation on the Oakland and Alameda electrified lines, will soon place an order for 116 cars, it is reported.

Wheeling (W. Va.) Traction Company has prepared specifications for 8 new cars, 45 ft. over all with 7½-ft. platforms. The cars will be fitted with steel-frame flooring and the car body construction will be novel, as the company is considering the use of 9-in. steel girder for a side plate, to extend to the end of the hood so as to form a cantilever projecting beyond the body corner posts to assist in supporting the platforms.

TRADE NOTES

L. E. Elwell Company, Detroit, Mich., announces that its address hereafter will be 536 Enterprise Avenue, Riverside, Cal.

Bausch & Lomb Optical Company, Rochester, N. Y., was presented on July 8 a handsome bronze tablet in memory of Henry Lomb, who died about a year ago, by its employees.

R. R. Thompson & Company, Brooklyn, N. Y., have removed from the Nassau Trust Building at 356-8 Fulton Street, that city, to the Cambridge Building, at Fifth Avenue and Thirty-third Street, New York.

Kincaid, Waller, Manville & Dawson, London, Eng., have changed their address from 29 Great George Street, Westminster, London, to St. Stephen's House, Victoria Embankment, Westminster, London, S. W.

Henry A. Mentz, 714 Hennen Building, New Orleans, La., consulting engineer, would like to receive, from manufacturers and dealers, catalogs, circulars, etc., descriptive of railway, light, power and industrial apparatus and supplies.

Allis-Chalmers Company, Milwaukee, Wis., announces that Edward G. Dewald, heretofore manager of the water-wheel department of the Platt Iron Works Company, Dayton, Ohio, has become identified with its hydraulic turbine department, as special representative for the Pacific Coast, with headquarters at 599 Mission Street, San Francisco.

Electric Storage Battery Company, Philadelphia, Pa., announces that H. B. Marshall, who has been connected with its Chicago sales office in the Marquette Building for many years, has been recently appointed contract agent, in charge of the St. Louis office in the Wainwright Building. Taliaferro Milton, formerly contract agent of the St. Louis office, has been appointed engineer of the Chicago sales office of the company.

H. M. Byllesby & Company, Chicago, Ill., announce that C. E. Groesbeck, San Diego, Cal., has been elected a vice-president of the firm, with headquarters at Tacoma, Wash. Mr. Groesbeck will be in charge of the company's interests on the Pacific coast and in the States of Idaho and Montana. Byllesby & Company also announce that they have taken over the property of the Tacoma (Wash.) Gas Light Company. H. M. Byllesby & Company have also appointed H. Almert, an engineer of long practice in Chicago, manager of its department of examinations and reports. The Byllesby organization has also been increased by the appointment of W. R. Thompson as assistant to the chief

engineer. Mr. Thompson was recently with the Public Service Commission, New York, and formerly with Westinghouse, Church, Kerr & Company.

Westinghouse Storage Battery Company, Pittsburg Pa., was incorporated at Albany, N. Y., on July 12, with a capital of \$1,750,000, including \$250,000 in 6 per cent preferred stock. The incorporators are: H. H. Westinghouse, Samuel B. Dusenberre, George C. Smith, H. Cool and John G. Greenburgh. Heretofore the Westinghouse storage battery has been an interest of the Westinghouse Machine Company, having been developed in a storage battery department of that concern, and regularly placed on the market about two years ago, in types for all classes of storage battery application, from signal service to power station use. The plates are of the Planté type, consisting of thin ribbons attached to the top and bottom of the plate frame or to panel cross-bars.

J. G. Brill Company, Philadelphia, Pa., announces that George Brill, second son of J. G. Brill, founder of The J. G. Brill Company, after 16 years' service with that company, has retired to seek relaxation in travel and personal work. His son, Byron O. Brill, who has been his assistant in the lumber department, will take his place. George Brill has a large number of friends in the railway and lumber fields who will regret his retirement but will applaud his judgment in taking leave of official cares when in the prime of life and capable of enjoying in full a well-merited vacation. Mr. Brill sailed July 10 for an extended European trip. Prior to his departure, he was the guest of honor on July 7 at a dinner given by James Rawle, president of The J. G. Brill Company, at the Radnor Hunt Club, Bryn Mawr, to the department heads of the company and friends and associates of Mr. Brill.

Westinghouse Companies, Pittsburgh, Pa., judging from the improved conditions of trade, appears to be assured before the close of 1909 of approximating, if not actually exceeding, the record of 1907. The Westinghouse Air Brake Company, Wilmerding, Pa., has received a large number of orders for brake apparatus and friction draft gear. As an index of the improved conditions at the Union Switch & Signal Company, Swissvale, Pa., this plant is now employing about twice the number of men it did a year ago. In June the Westinghouse Electric & Manufacturing Company enjoyed an improvement of 25 per cent over its business of May. A large order for railway motors secured from the Manhattan Elevated Railroad is noteworthy. Switchboards and auxiliary supplies amounting approximately to \$500,000 have also been ordered by the Pennsylvania Tunnel & Terminal Company for the New York terminals and tunnels of the Pennsylvania Railroad. In line with the encouraging improvement noted by the Westinghouse Machine Company, the Philadelphia Rapid Transit Company has recently placed orders for 2 steam-turbine equipments, of 6000-kw and 12,000-kw capacity, respectively. Daniel E. Manson, who has resigned as manager of the Boston office of the Westinghouse Electric & Manufacturing Company to engage in engineering work with a corporation of which he will be vice-president and manager, was tendered a farewell dinner in Boston, July 13, by the officers and associates of the Westinghouse Electric & Manufacturing Company. Mr. George E. Bates, of the Boston office, will succeed Mr. Manson as head of the Westinghouse sales force for the New England district.

ADVERTISING LITERATURE

Frank Ridlon Company, Boston, Mass., has issued its regular monthly list of second-hand electrical equipment for July.

Arnold Company, Chicago, Ill., is sending out a post-card panoramic view of the locomotive and car repair shops which it has recently completed for the St. Louis & San Francisco Railroad, at Springfield, Mo. The shops were put in operation July 5, 1909.

William B. Hough Company, Chicago, Ill., is sending out a folder entitled "The Advance Agents of Prosperity," which calls attention to its Ransom concrete mixers, Wrightwood hoisting engines, contractors' industrial, mine, concrete and special work cars, Hercules buckets and M-B special open-hearth steel reinforcing bars. The company's concrete mixers can be supplied either with electric motor or with engine drive.

H. W. Johns-Manville Company, New York, N. Y., has issued an illustrated folding postal card entitled "Stucco Suggestions," showing a number of residences where J-M asbestos stucco has been used. A circular, enclosed in the card, contains specifications for mixing and applying stucco. The H. W. Johns-Manville Company has also issued a folder on its Leak-No metallic compound, a cheap pipe joint cement sold in powdered form. Half-tone illustrations accompanied by short text illustrate the use of Leak-No in factory work, by plumbers, steam and gas fitters, and for automobile repairs and other purposes.