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Dilution of Average Fares by Transfers

W. A. House, president of the United Railways & Electric Company of Baltimore, has contributed, in his annual report to stockholders for the year 1908, to the current discussion regarding the dilution of the average revenue per passenger carried, resulting from the extended use of transfers. A system of universal transfers became operative in Baltimore in 1890 and since that time there has been the same rapid increase in their use which managers of urban traction properties have witnessed with concern in

other cities where no remedial restrictions are imposed. The compilations by other companies of statistics similar to those presented by Mr. House [see ELECTRIC RAILWAY JOURNAL of April 24, 1909, page 797] and the increasing appreciation throughout the country of the possibilities of abuse of the transfer system, lead naturally to an inquiry as to how long the process of continued reduction in the average fare per passenger carried can be borne. The average revenue per passenger on some lines has been brought from 5 cents to the neighborhood of 3 cents by the rapid spread of the legitimate use of transfers accompanied by an even more rapid increase in the illegitimate use of the privilege; since that fact has been demonstrated by recent developments in various cities it is important that the public should understand clearly that the tendency cannot continue indefinitely in its present direction without disaster.

A Bureau for the Prevention of Accidents

In creating a bureau for the prevention of accidents, the Philadelphia Rapid Transit Company has taken a step that should meet with public approval and yield ample returns on the investment. The first superintendent, F. W. Johnson, has done distinctive work with motormen and conductors, primarily for the benefit of the claim department, with which he was formerly identified; but the effect of the instruction given was seen in the improved interest of trainmen in the prevention of avoidable accidents.

The duty of avoiding all risks that may lead to accident belongs no less to the general public than to the conductors and motormen of street railways; each class should be equally concerned in preventing injury or the destruction of life. Corporations are beset with claims arising from real or simulated injuries, the result of actual or pretended accident, and anything that can be done to lessen the number of claims that have no just basis will tend to bring sharply into relief what should be the only problem of this nature. This is the reduction of the opportunity for accidents so far as that result can be accomplished by human foresight.

The training of motormen and conductors in this important matter will never be complete on any large city system, because of the large proportion of men who retire from the service each year; nor will the time ever come when the education of the public will reach the point of perfection, but continued effort will undoubtedly so impress thousands of people that the simple accidents that are so common on street railways will be reduced. If the prevention of accidents could be taught to each trainman and to each passenger as a subject of vital, personal welfare to himself, all would realize how much easier it is to follow

simple precautions rather than always to suffer the regret which follows a preventable casualty.

When the results of public education in other respects are considered, it is futile to say that electric railways cannot profit by continual endeavor to lead travelers to appreciate the dangers with which they are inclined to be so familiar that fear and precaution may be forgotten. The American Red Cross Society has spread, systematically and successfully, the facts regarding tuberculosis, with unquestioned benefit to mankind, and sound business motives will justify electric railway companies in the adoption of extraordinary means to curtail the startling numbers of accidents and their cost in large cities.

The Work of the Legislatures

The attempts at public utilities legislation, so called, at the sessions of the Legislatures of the different states now being concluded have failed in New Jersey, Indiana, Kansas, West Virginia, South Dakota, Idaho, Utah, Nevada, Oklahoma, Iowa, Nebraska, Colorado, Maine, New Hampshire and Minnesota. In Connecticut the public utility bill has been reported adversely by the judiciary committee of the House. As previously noted in the *ELECTRIC RAILWAY JOURNAL*, Vermont is the only State successful in its attempt to emulate New York and Wisconsin. The bill in Iowa resulted in the appointment of a special committee to report to the next Legislature, and the attempt in New York to amend the present law so as to bring telegraph and telephone companies under the commissions resulted in the matter being referred to a committee to report at the next session. Except possibly in the cases of New Jersey and Connecticut, where they received extended consideration, the bills for new commissions could hardly be taken seriously.

It would be impossible here to point out all of the ridiculous conditions incorporated in some of the measures, but that the bills were very largely unjustified is strikingly illustrated in the case of the Utah measure. An eloquent plea was made for the measure in Utah by its fanatical author, who had as his guiding star a Governor who had recommended that a measure such as the author had drawn should be passed. There are less than 200 miles of electric railway in Utah and only one railroad that really is important, that would have come within the provisions of the bill. Still it was proposed to create a commission of three members at a salary of \$3,500 a year each and a total cost to the State variously estimated at from \$25,000 to \$50,000.

In New York State both Houses have passed the bill broadening the conditions under which the Public Service Commission may grant franchises for the construction of rapid transit lines in New York City with private capital, and the Travis-Lee constitution amendment exempting income producing bonds from the debt limit of New York City. The Travis-Lee amendment is intended to provide funds for the construction of additional rapid transit lines by the city. It passed at the 1908 session and must now be submitted to popular vote for approval. The cheap bid for popularity by Senator Wagner in New York with his bill for a 5-cent fare to Coney Island failed.

The trolley freight measure in New Jersey, after many vicissitudes, finally was approved. The original measure

was vetoed by the Governor. A second measure was then introduced. The Governor announced his opposition to this second measure, citing his reasons, and a third measure drawn so as to overcome his objections was introduced at the last moment and became a law. The Jersey freight law should work to the advantage of the electric railways in that State and at the same time be of benefit to the public. Legislation in Pennsylvania was largely of a negative nature, the most important bill to be defeated being the one taking out of the hands of the Railroad Commission its jurisdiction over street railways operating in cities of the second class.

Preventing Corrosion of Iron and Steel

Of the many theories advanced as to the cause of corrosion of iron and steel, the comparatively recent hypothesis that it results from electrolytic action, and not, as generally believed, from a purely chemical change, seems to be most convincingly demonstrated as correct. All the curious phenomena of rusting can be explained by it, and numerous experiments designed to prove its truth have yielded valuable scientific data on possible methods of preventing corrosive action. R. S. Perry, in a paper read recently before the Western Society of Engineers, summarizes the fundamental principles underlying the corrosion of iron according to the electrolytic theory as follows:

When iron is in contact with water, there will be a transfer of electricity from the free hydrogen ions of the water to the iron ions of the iron, causing the solution and subsequent oxidation of the metal.

The presence of impurities having a difference in potential to that of the iron in which they are contained, and the uneven distribution of such impurities, increases the amount of electrical action.

While there are certain compounds, sometimes found as impurities in iron and steel or used as pigments in protective coatings, which act as preventives of such action, there is a group of compounds, on the other hand, which act as preventives of such action. The investigators of the electrolytic theory have found that bi-chromates of some of the alkaline metals, particularly potassium bi-chromate, stand out as almost perfect preventives of rust when applied as surface coatings, or when added as impurities to iron or steel. The relative effects of these rust-preventing and rust-accelerating compounds when mixed in protective paints has been demonstrated by many accelerated corrosion tests, chief among which are the exposure tests now being made by the Paint Manufacturers' Association and the American Society for Testing Materials, on steel fences erected at Atlantic City.

Protective coatings for structural iron and steel have a two-fold purpose, to exclude moisture and air from the surface of the metal and to prevent the spread of any local corrosion which may start. Most protective paints consist of a finely ground metallic salt or other pigment suspended in a liquid vehicle, usually linseed oil with the addition of a small quantity of resinous gum. When applied in a thin coat the vehicle dries and adheres to the metal as an elastic, impervious covering. The pigment protects the paint coat from mechanical abrasion, assists in excluding moisture and gives the desired color. If the protective coating is pierced and moisture and gases come in contact with

the metal, local electrolytic action starts and corrosion results. The vehicle of the paint is, usually, inert, so far as the electrolytic action is concerned, but the pigment which is in close contact with the metal may be either an inhibitive or an accelerator of rust or it, too, may be inert. An inhibitive pigment will prevent to a great extent the spread of corrosion on the surface of the metal under the paint coat, which results in the common phenomena of blistering and peeling. On the other hand, an accelerating pigment may cause the initial rusting to spread rapidly and soon destroy the entire coating. It is important, therefore, in selecting structural paints to know the nature of the pigments used in compounding them. The pigments may be classed as harmful, safe or beneficial. Venetian red and some other artificial oxides of iron and sulphate of calcium, which are commonly used as pigments in structural paint, are said by Mr. Perry to be active accelerators of corrosion. Chromic salts in general are rust preventives, and there are a large number of inert pigments in use.

The composition of the iron and steel to which the paint is applied also influences the spread of corrosion, marked segregation of impurities in the metal causing extreme local pitting. The protection of steel structures therefore is dependent not alone on the paint, but on the rust-resisting qualities of the metal itself. However, the right kind of paint properly applied and frequently renewed if subject to abrasion or chemical deterioration through the action of gases and fumes will do much to prevent serious corrosion of the metal on which it is spread.

Side-Rod Electric Locomotives

The new side-rod electric locomotive which is described elsewhere in this issue represents a reversion in all of its mechanical details to long-established steam-locomotive practice. The wheel arrangement, with a four-wheel bogie truck at one end, three pairs of coupled driving wheels and a two-wheel radial pony truck at the opposite end, is exactly the same as that commonly designated as the "Pacific" type by steam-locomotive designers, and is the type which has been generally adopted for heavy high-speed passenger service. With the exception of the bearings for the jack shafts to which the motor connecting rods are attached, the trucks, frame, spring equalizing system and the wheels and axles are precisely the same as are used on a steam locomotive. The entire weight of the machine, except the wheels, axles and side rods, is spring borne. The center of gravity of the locomotive is much higher than that of either the New York Central type or the New Haven type, but is somewhat lower than that of a steam locomotive of the same general dimensions.

The general distribution of weight in modern steam locomotives is the result of developments in design covering a long period of years, and has been dictated largely by necessity, rather than by theoretical considerations. It is a curious fact that the distribution of weight as it exists to-day, although arrived at by rule of thumb, is generally agreed upon by steam locomotive designers to be quite satisfactory. The tendency in electric locomotive design, therefore, toward substantially the same distribution of weight is not mere imitation, but is a logical step toward the construction of a machine which is equally as powerful

as the largest steam locomotives and is mechanically as well balanced and easy riding. Thus a high center of gravity is desirable, because it greatly relieves the strain on the head of the rail when the locomotive rocks or cants outward in rounding a curve.

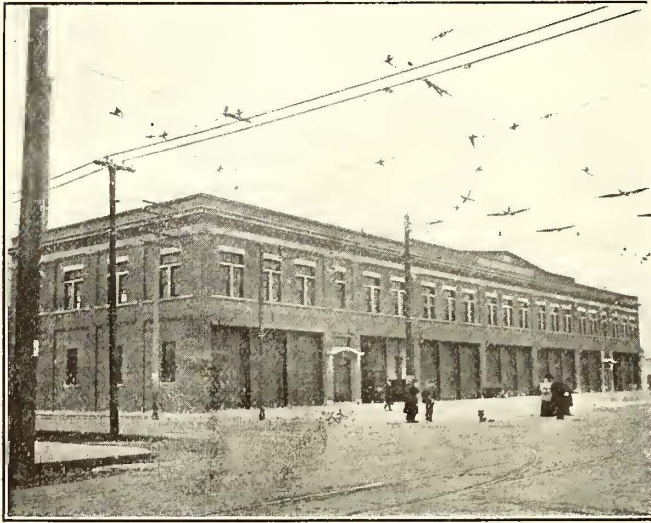
One of the points which has often been advanced as an advantage of existing designs of electric locomotives is that the revolving parts are in perfect balance, and that no blow or nosing effect results from the rapid reversal of motion of unbalanced reciprocating connections. It is possible to counterbalance perfectly the weight of side-connecting rods. The difficult problem in steam-locomotive design has always been to approximate a correct counterbalance on the driving wheel to which the piston connecting rod is attached. This connecting rod has a reciprocating motion at one end and a circular motion at the other end. In this new electric locomotive the side rods are balanced perfectly and the inclined connecting rods from the motor crank arms to the jack shafts are counterbalanced at each end, their motion being exactly the same as that of the side rods, but in a different direction. The center of gravity of the jack shaft counterbalance is, of course, between the prolongation of the axis of the horizontal side rod and the inclined connecting rod.

The use of two motors of large capacity mounted above the frames gives this design a number of advantages over the use of many motors mounted on the axles. The weight per horse-power of large motors is less, of course, than of small motors of the same aggregate capacity and of the same electrical characteristics. The location of the motors above the frames places them out of the way of dust and dirt, permits of better ventilation and greater accessibility for inspection and repair. It also permits the use of armature bearings of ample size, and for this reason a reduction of the air-gap to a minimum. This has a marked effect on the mechanical and electrical efficiency of the motors. As plenty of space is available above the frames it is possible to use with large diameter driving wheels slow-speed motors without interposing any gearing. It is interesting to speculate on the effect of this design upon the desirability of 15-cycle single-phase motors. One serious drawback to this type of motor has been that it was larger than the d.c. motor, or even than the 25-cycle single-phase motor, and that the available space on the axle was hardly sufficient for large-sized motors. With the motor above the frames this difficulty practically disappears. The general design of the locomotive described is, of course, adapted for use with any form of propulsion current and for either freight or passenger service. Two direct-current motors, single-phase series motors or three-phase motors can be mounted on the frames, and the motors are interchangeable at will without in any way affecting the running gear. The electrical equipment could be shifted from one locomotive to another just as it is shifted from summer cars to winter cars by street railways.

It is interesting to learn in this connection that the new electric locomotives to be used in the Pennsylvania Railroad tunnels in New York City also are to employ the side-rod method of driving, with the motors placed above the frames. These locomotives are to consist of two units, each carrying a 2000-hp direct-current motor.

LARGE NEW CAR HOUSE OF CHICAGO CITY RAILWAY

The Chicago City Railway Company has just completed at Ashland Avenue and Sixty-ninth Street a large fire-proof car house with especially elaborate accommodations for division officials and trainmen. The new building occupies the block between Sixty-ninth and Seventieth Streets and Marshfield and Ashland Avenues. Its width is 265 ft. 3 in. and it is 487 ft. long. The two ends of the building are set back about 55 ft. from the property line to permit cars to enter between columns placed between the tracks in each bay. The building is subdivided into



Chicago City Railway Car House—Sixty-ninth Street Elevation

six car-storage bays and one repair and general-utility bay. A second-story portion on the Sixty-ninth Street end is subdivided into storerooms, a clubroom, trainmen's rooms and division offices.

CONSTRUCTIONAL FEATURES

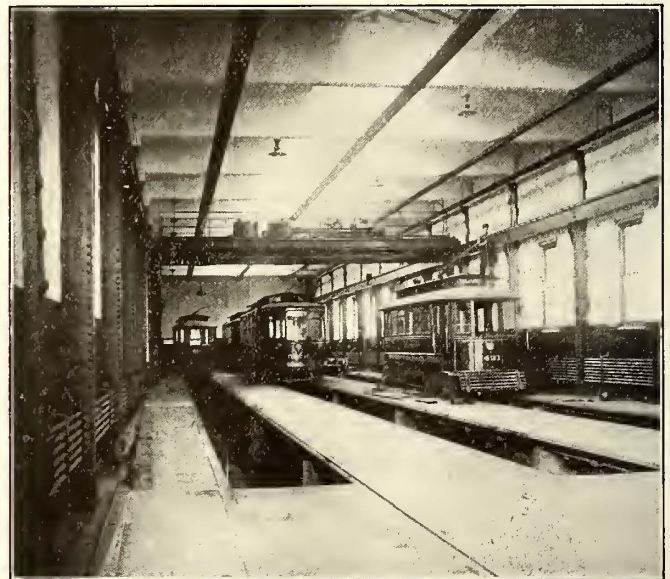
The accompanying plan shows the relative arrangement of the car-house bays and the through connecting tracks which are built so that all cars may enter from the south or Seventieth Street end and leave from the north end without any unnecessary shifting or reverse movements. When cars are turned in at night for cleaning and inspection they are passed progressively from the south end of a bay without shifting from track to track. As they enter at the south end they are washed, then moved forward to be cleaned and fumigated, then run ahead over a pit for inspection and adjustment. Finally when ready for service, they are moved to the north end of the bay, there to await the demands of the transportation department.

To facilitate this method of handling cars, through tracks with connecting switches at each end have been provided in all but the repair bay. A loop track extends completely around the building. The car-house curves are laid out for complete clearance with adjacent main tracks and have a minimum inside radius of 40 ft. The three leads to each bay are united into one track which in turn connects with a ladder track parallel with the building at each end. The ladder track on Sixty-ninth Street is gauntleted with the main track so that there will be the least possible wear on the special work. As no main line passes the building in Seventieth Street, the tracks are not gauntleted, but the leads of two of the bays are connected with an independent ladder which facilitates the rapid handling of cars and permits of using a larger radius on the approach curves.

All of the yard space between rails and tracks outside of the ends of the building is paved with granite blocks, affording a smooth surface on which to handle cars should they become derailed. The granite blocks used in this pavement were taken from the old cable tracks that have been relaid during the rehabilitation period. According to the ordinance the company was not permitted to relay these blocks in the streets and therefore good use of part of them is made in paving car-house yards and the rest are crushed for concrete.

The exterior walls of this new car house are faced with No. 1 purple Continental brick and have white cut-stone trimmings. Floors and roofs are made of reinforced concrete. The division walls and pilasters are built of Chicago brick. Each bay with its three tracks will hold approximately 30 48-ft. cars. The repair bay has three pit tracks with a capacity for five cars each. All of the car-storage tracks have pits 250 ft. long, open from wall to wall. The total capacity of the car house is 191 double-truck cars and there is sufficient space on the property outside of the building to store 25 cars. The end openings are closed by Kinnear steel rolling doors. The walls of the car-house bays have but two openings each, one near each end, all of which are protected by means of double automatic steel fire-doors, so that one bay of 30 cars represents the maximum loss or risk from fire. The two-story portion and the rooms of the service bay are similarly protected and separated by means of double automatic fire-doors.

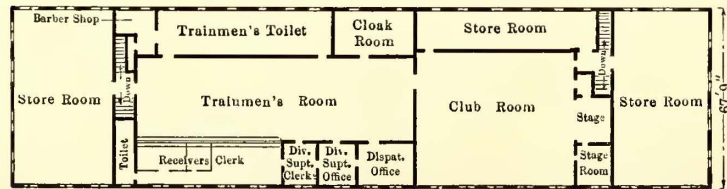
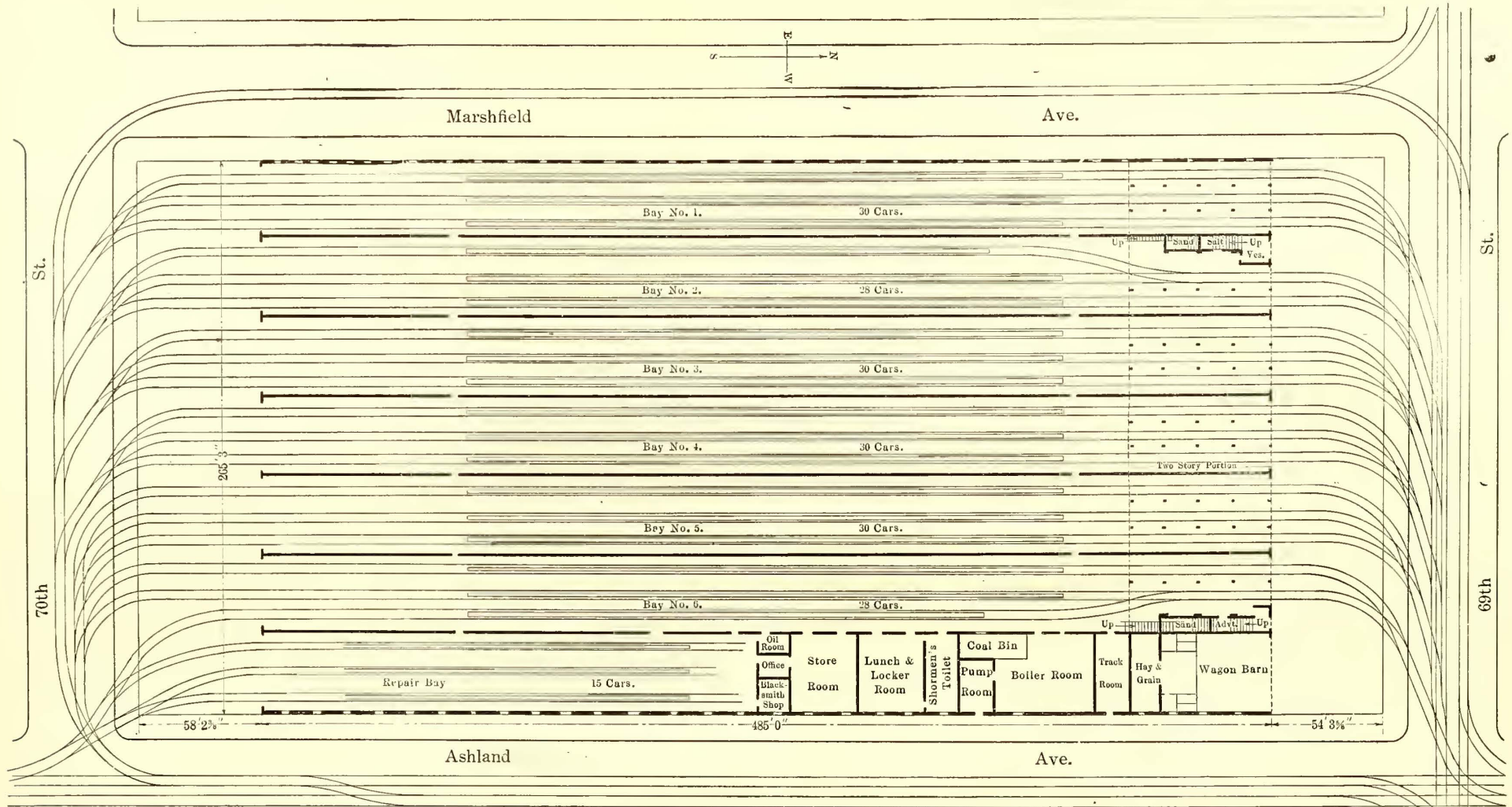
Each bay is lighted in the daytime by a continuous skylight 8 ft. wide located over the center track and extending the full length of the bay with two sidelights in sections of 16 ft. long each. The repair bay has a skylight 12 ft. wide with sidelights for its full length. Small skylights



Chicago City Railway Car House—Interior of Repair Bay

are placed over all the smaller rooms in the repair bay and in the roof of the two-story section which contains the division offices and trainmen's rooms. There is a total of about 30,000 sq. ft. of Anti-Pluvius skylight construction in this building.

The reinforced concrete roof slabs, which are $4\frac{1}{2}$ in. thick, were cast in the molds as a monolith over the entire structure except that part which is two stories high. This roof slab is 417 ft. long and 265 ft. 3 in. wide, the full width of the building. Provision for expansion is made at the ends where the concrete roof joins the brick parapet



Second Floor Plan

Chicago City Railway Car House—Plan of First Floor and Track Layout and Trainmen's Quarters on Second Floor

walls. Galvanized-iron flashing protects the expansion joint from the weather. The roof slab is supported by concrete girders spanning the bays on 16-ft. centers. Corrugated bars rerolled from old rails were used for reinforcement. It is stated that the high-grade steel obtained from the old rails when reworked into the smaller-sized

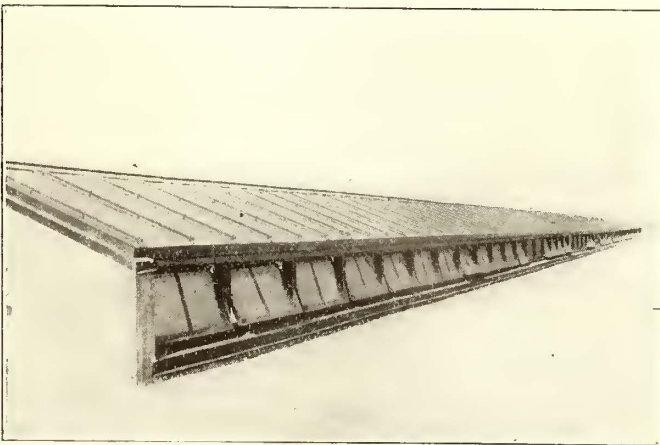


Chicago City Railway Car House—Overhead Lighting in Storage Bay

bars gives excellent results because of the refinement brought about by the additional working which the steel received. The following specifications were issued to cover the steel for $\frac{1}{2}$ -in. bars:

Furnish and lay rods for reinforcement of concrete of each size called for. All rods are to be of high carbon steel, manufactured by the open-hearth or Bessemer process, chemical properties to be limited as follows:

- Phosphorus shall not exceed 0.06 per cent.
- Sulphur shall not exceed 0.06 per cent.
- Manganese shall not exceed 0.06 per cent.



Chicago City Railway Car House—Monitor Skylight over Repair Bay

Tensile strength shall not be less than 90,000 lb. per square inch.

Yield point shall not be less than 50,000 lb. per square inch.

Rods shall not fracture on the outside bent portion when bent cold through an angle of 105 deg. around a diameter equal to their thickness.

Elongation shall not be less than 10 per cent in a length of 8 in.

Variations in weight and section are not to exceed $2\frac{1}{2}$ per cent.

Furnish written and certified report of chemical analysis and tensile and bending tests.

Give separate figure for using corrugated or deformed bars (stating make of bar) of equal net section to bars shown on drawings.

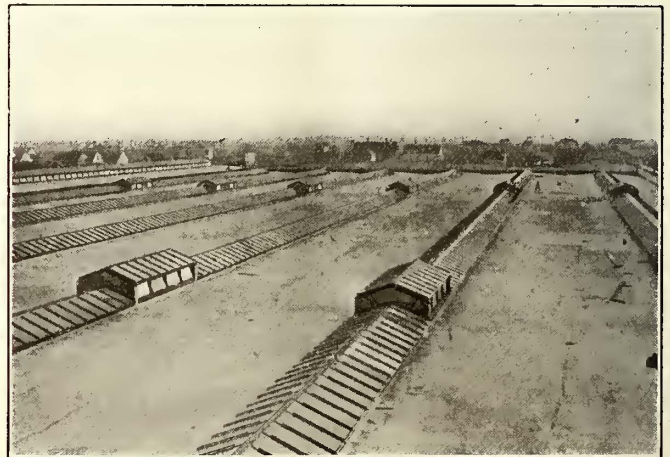
The specifications issued for the concrete to be used in reinforced floors and roofs follow:

Wherever reinforced floor and roof slabs are called for the same are to be made of concrete of a mixture of 1 part Portland cement, $2\frac{1}{2}$ parts of sand and 5 parts of broken stone. All stone for this work is to pass through a $\frac{1}{2}$ -in. ring. Use a rather wet mixture for all this work. Space all reinforcing rods accurately, as shown on detail drawings, and block same up by means of concrete blocks and other devices as called for. Wire ends of rods where same cross each other to prevent displacement. Before placing concrete thoroughly wet the forms and spread a mortar made of 1 part cement to 3 of sand over cracks to prevent leaking away of rich cement mortar in concrete. Top finish of all roofs to be $\frac{1}{2}$ in. thick of 1:3 cement and sand rodded and broom finished. Furnish all required concrete blocks.

The forms used in constructing the roof slabs and its supporting girders were built so that they could be removed part by part to permit of the most rapid drying of the concrete. This design is illustrated. When the roof slab had set the form underneath was removed. Next, the boards at the sides of the girders were taken away to permit these to dry out and, lastly, the supports underneath the girders were withdrawn. All parts of the forms were made of light material and none were so large that they could not be handled by one man. In this way the work of setting and removing forms was greatly expedited with very little damage to the lumber. Some of the forms were used more than three times on different parts of the roof of this car house and then were shipped to another car house of similar design, where they were used twice. The specifications for these forms follow:

The constructor is to furnish and erect in place all forms for foundation, pit floor and reinforced concrete floors and roofs.

Foundation forms to be made of 2-in. plank, dressed on



Chicago City Railway Car House—Continuous Skylights over Storage Bays

one side and to be securely braced and wired to prevent bulging.

Forms for pit floors to be made of 1-in. hemlock sheathing, resting on 2-in. pine centers well supported.

Forms for second floor are to be of 1-in. hemlock sheathing, laid on 2-in. x 12-in. joists spaced 24 in. apart.

All roof forms are to be of 1-in. sheathing, resting on

2-in. x 12-in. joists spaced about 2 ft. 6 in. apart. Joists are to be suspended from top cord of truss.

As no covering was placed on the car-house roof special care was used in finishing the upper surface of the large concrete slab. It has been the experience of the Chicago City Railway Company that concrete roof slabs, if cast rather wet, will be sufficiently watertight without the use of waterproof covering for a roof over car-storage space. In depositing the concrete great care was taken so that there might be no surface cracks. Concrete was placed along the roof, two bays at a time, and at night the line of concrete was stopped in the center of a span between trusses so that if later there should be deflection at the center of the slab, it would tend to close any opening that might appear where the mixture of two days joined.

Before depositing the concrete in the forms all bolts for supporting feed wires, trolley boards, arc lamps and steam mains were set in the forms by transit line. The electrical wiring conduits, which are 1 in. in diameter, in groups of six and seven, are run across the building through the supporting girders. Had these pipes been placed in the roof slab they would have been exposed underneath the skylights.

TWO-STORY SECTION

The Sixty-ninth Street end of the car house has a second story 67 ft. 9 in. wide extending across the building. This floor is subdivided by 12-in. brick firewalls into three fireproof sections comprising a storeroom at either end and trainmen's rooms adjoining offices at the center. The

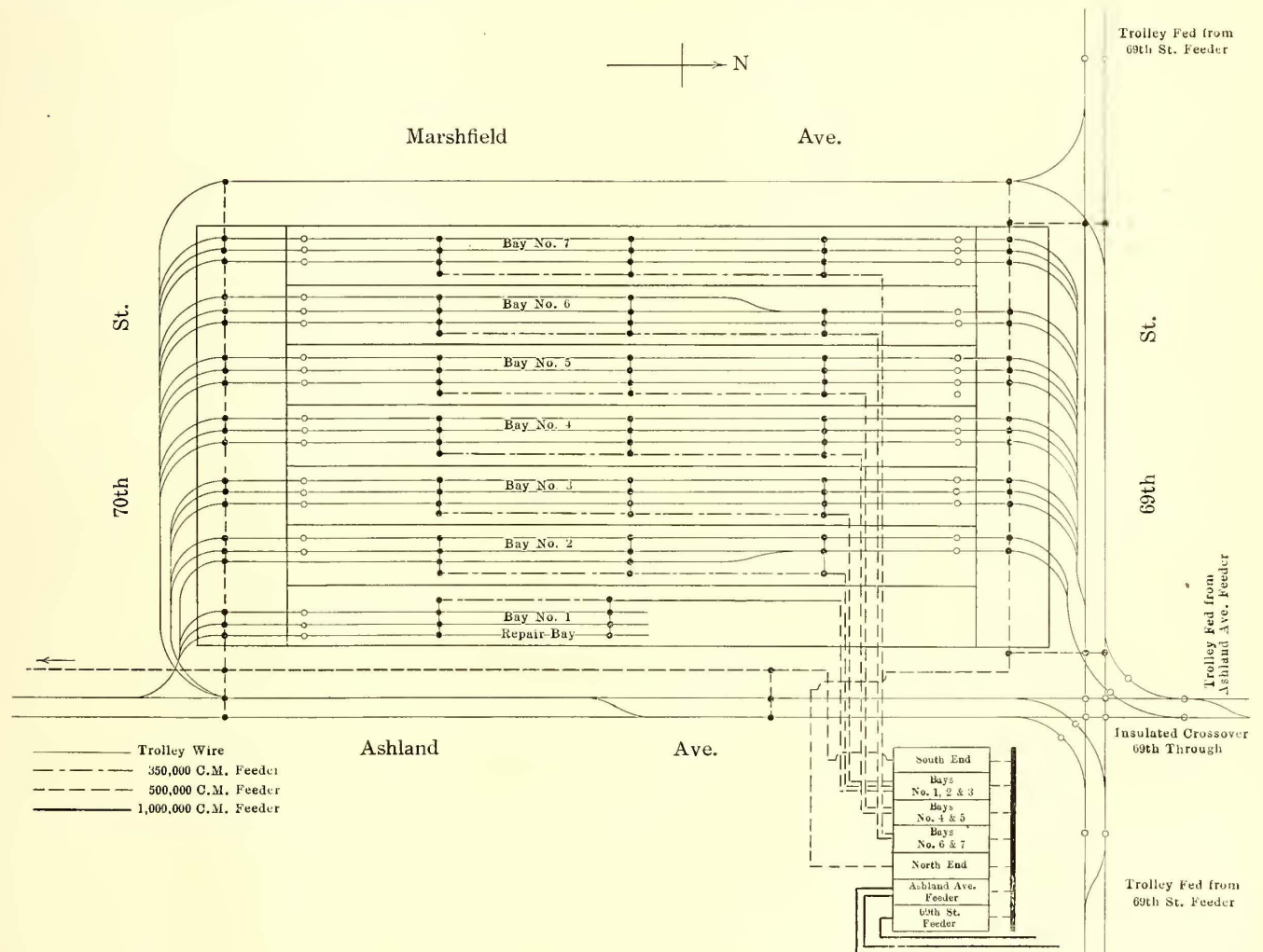
center section in turn is subdivided by hollow tile partitions into the following rooms, the arrangement of which is illustrated: Clubroom with stage, cloakroom, trainmen's



Chicago City Railway Car House—Scaffolding Supporting Roof Slab Forms

room, trainmen's toilet, barber shop, dispatcher's, division superintendent's and receiving clerks' offices.

The interior finish of the second story is heavy quarter-



Chicago City Railway Car House—Plan of Wiring, Showing Sectionalization of Trolley Wire in Bays and Approaches

sawed white oak cabinet work. The floors in the trainmen's room and toiletroom are laid with red tile and the wainscot and partitions are slate. The fittings in the latter room are especially fine, as shown by the illustrations. A sanitary drinking fountain is provided in the center of the toilet-room and plate-glass mirrors are mounted over the enameled iron wash bowls. Each storeroom has a concrete floor, in the center of which is a balanced steel trap



Chicago City Railway Car House—Trainmen's Room on Second Floor

door through which the supplies may be passed to and from the ground floor. In the clubroom and operating offices the floors are hard maple and that in the clubroom is scraped, cross planed, sanded and waxed for dancing purposes.

The accommodations in the receiving office are especially complete. This section of the second floor is set off from the trainmen's room by a substantial partition with sash filled with clear wire glass. The heavy black walnut counter has slate dealing plates and woven wire screens enclose the section occupied by the receivers. Behind the clerks' counter is a large case for storing "lost articles." Underneath the receiving counter are electrical trips for a burglar alarm. The contacts are controlled by a part of the footrest, thus requiring an unnoticeable movement to



Chicago City Railway Car House—Stage in Club Room

operate. When once pushed the contacts automatically lock, so that it is necessary to stoop below the counter to release them.

PAINTING

The specifications for the general interior painting are presented in full herewith:

Material.—All paint to be strictly pure white lead, pure linseed oil, pure colors ground in oil and turpentine unless otherwise specified.

Where "Standard Green" is specified, same is to be a special green paint ground by Sherwin-Williams Company under name of "Chicago City Railway Company Standard Green."

Where graphite paint is called for it is to be Dixon's graphite.

Asphalt paint to be Western Roofing & Supply Company black asphaltum or equal.

All colors in oil to be Sherwin-Williams Company best colors ground in oil or equal.

Use Wheeler's wood filler for all oak.

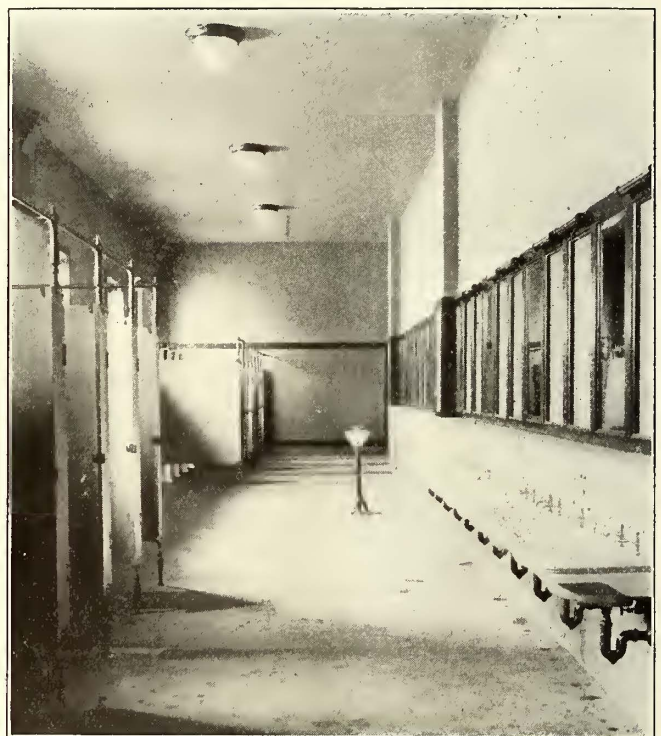
Varnish to be Murphy Varnish Company best quality or equal.

Whitewash material to be George Fletcher & Company "Monarch" or other cold wash paint as approved by Board of Underwriters.

All material to be delivered at the building in the original sealed packages and approved by the engineer in charge before using.

Exterior Work.—Thoroughly shellac all knots.

All exterior woodwork to receive two coats oil paint in addition to priming coat. Final coat to be standard green, except flag pole, to be white. All exterior sheet metalwork,



Chicago City Railway Car House—Trainmen's Lavatory

all exposed ironwork, including Kinnear doors, to be painted two good coats. First coat to be graphite and final coat standard green. Outside of main doors and frames to be painted, grained and varnished to match quarter-sawed white oak.

Interior Work.—All trusses and other iron which is to be fireproofed shall be given a good coat of graphite before fireproofing. All other exposed ironwork, including Kinnear doors, stairs, fire-doors, fire-windows, etc., to receive a coat of graphite and a coat of standard green. All woodwork (except oak and walnut, which are to be varnished,) is to be painted a coat of lead and oil and a coat of standard green. This includes all trolley boards. All interior standing finish of trainmen's room, clubroom, toilets, barber shop, stair halls and connecting rooms will be finished in quarter-sawed white oak with black walnut counters. This woodwork to be filled to match samples which will be furnished by the engineer in charge. Filler to be well wiped out and allowed to become thoroughly dry before shellacing. All this work to receive two coats of varnish after erection and final coat rubbed to egg-shell gloss with powdered pumice stone and rubbing oil. Use best spar varnish for all window sills, doors to toilet compartments and outside of entrance doors and frames.

Floors in clubroom to be given a coat of shellac and finished with floor wax, using weighted brushes. All other wood floors in offices, etc., to receive a coat of boiled oil and two coats of best floor varnish.

Walls and Ceiling in Offices.—All walls and ceilings in offices are to receive first, two coats of lead and oil, next, apply one coat of ground glue sizing. Apply a final coat of paint and stipple with stippling brushes.

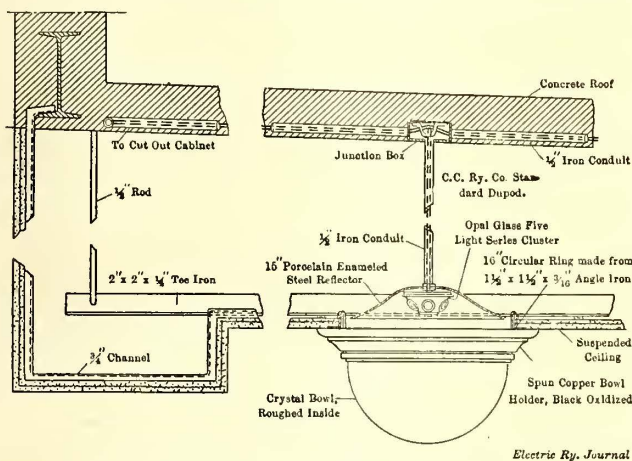
Putty.—After first coat of paint or varnish all nail holes, etc., to be filled with putty and smoothed over before applying next coat. Wherever wood is varnished putty to be colored to match the finish. Sandpaper freely between coats.

Whitewashing.—All exposed walls and ceilings to be given two or more coats of cold-water paint to a uniform white color. Whitewash may be applied with spray machine, but all defective places must be made good and material applied with brush whenever necessary. Protect all glass, floors, pipes, etc., and clean whitewash from all surfaces not intended to be whitewashed.

Dados.—Along all walls of car house and rooms on first story, paint dado 5 ft. 6 in. high with black asphaltum paint. Apply two or more coats if necessary for a uniform black surface.

REPAIR BAY SECTION

The repair bay section at the rear of the car house is so laid out and equipped that all minor repairs may be made on the cars housed at this station. Spanning the



Chicago City Railway Car House—Details of Ceiling Clusters in Trainmen's Rooms

three tracks of the repair bay are two Niles electric cranes capable of lifting a car body from the trucks and moving it laterally or longitudinally so that it may be placed directly over another set of trucks on any of the three tracks within the bay. Each of the two cranes has two drums with two hooks set 9 ft. 6 in. apart. Each drum has a lifting capacity of 4 tons. By this arrangement of drums and with hooks spaced apart the width of the car body the maximum headroom for lifting is obtained, which is greater than could be had if one hook with a yoke was used.

In the same division of the building with the repair shop, and just forward of it, are several utility rooms, the general arrangement of which is shown on the plan. The rear subdivision of the utility space is an office for the foreman with an oilroom on one side and a blacksmith shop on the other. Connecting with the repair shop through the foreman's office is a storeroom. Next are lunch, locker and toilet rooms for the shop men. The heating plant is next in the row. The boilers are served by a Weber steel-concrete stack. The building is heated by steam pipes laid out according to the Van Auken system installed by the Consolidated Engineering Company, Chicago. Outside of the repair bay no ceiling coils are used and wall coils are

installed only at the ends of the bays where they will most efficiently warm the air entering through the car-house doors. The pits are heated by four 2-in. pipes laid under each walk between the tracks. The plumbing includes a large number of water connections located near the south end of the building where car washing is done.

At the front of the service bay are a room and stables for wreck wagons, with hay and grain storage at the rear. These wreck-wagon rooms were located at the front and most prominent corner of the building so that the least amount of driving and turning would be required when the wagon answered an emergency call. Also this location is an economical one because the wreck-wagon man, when not otherwise engaged, replaces or repairs the trolley poles of passing cars on notice from conductors.

ELECTRICAL WIRING

All the lighting and power wires in the car-house center at a switchboard in the pumphouse adjoining the boiler plant. There are two feeder panels on this board, each of which is fed by independent sections of trolley network which are in turn fed from two substations. A transfer bus provides for receiving current from either station. There are five other sub-section panels on this board controlling and sectionalizing the feeders within the building and the trolley wires over the trackwork surrounding the building and to a distance of 100 ft. outside of the connecting special trackwork.

The general layout of the 500-volt feeders is illustrated. One panel of the switchboard controls the trolley feed for the ladder tracks at one end of the building and for one-half the length of the building along the street on the other side. Another panel similarly controls the current fed to the trolley wires over the other half of the outside special work. The remaining panels, with duplicate sets of switches and circuit breakers on each, control the current fed to the wires in each of the six bays. With this scheme of sectionalization, at the time of a fire in any of the car-house bays, the trolley wire over the yards outside of the burning end of the building could be made dead so that the work of the fire department might proceed with safety. Meanwhile current could be kept on the trolley wires in any or all of the bays and over the special work at the opposite end of the car house so that the fullest opportunity would be provided for running out the cars. In other words, the trolley wires within the bays and yards are so sectionalized that current may independently be cut off from any bay or from the yard tracks at either end.

The two feeder panels through which the current is received for distribution at the car house are fitted with wattmeters which record the total load used within the confines of the car-house special work. A separate board is installed for controlling the lighting and power current only, used in the shop and throughout the building. All light wiring is independent of the trolley so that in emergencies the current may be cut off from the trolley wire and the lights left burning. Each bay is illuminated by six GE enclosed arc lamps and two similar lamps hung one at each end outside. The arc lamps are provided with mirror reflectors so that all the light is thrown down where it may be useful. Each of the three pits in a bay has 20 incandescent lamps on a separate circuit.

Across each end of the car house, just beyond the ends of the pits, is a line of openings through the partition walls serving a walkway from bay to bay. It is planned that when the work on the cars in one bay has been completed for the night the arc lamps and the pit lights will be put

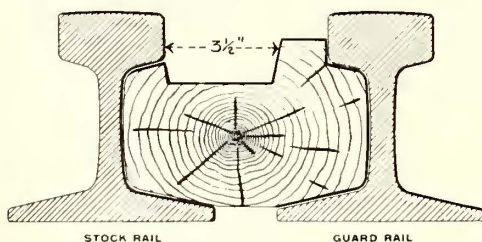
out in that bay so that the current may be saved. To provide for illuminating the passageway across the car house, a cluster of lamps has been placed over each of the fire-doors in the curtain walls. With this arrangement the workmen may pass from bay to bay at night along a well-lighted passageway, even though the general illumination in any of the bays has been cut off.

The general illumination in the division headquarters is by 16-in. crystal bowls hung from the false ceiling in spun copper rims, as shown in the illustration. The conduits of the ceiling lighting are laid in the concrete roof and the outlets extend down to the suspended ceiling. Inserted in the suspended ceiling are angle-iron rims which support the 16-in. crystal bowls enclosing the lamp clusters. A 1-in. annular space is left between the bowl and the rim to provide for the escape of hot air. The lamps within the bowls are held in Harder cast-glass five-light clusters, above which are placed white steel-enameled reflectors.

BLOCKING FROGS AND BEVELING GUARD RAIL ENDS

The Railroad Commission of Indiana has sent to the chief engineers of all the steam and electric interurban railways operating within the State a circular of inquiry regarding the value of blocking frogs and beveling guard-rail ends. The questions follow:

1. What is your opinion as to the value of blocking frogs, guard rails and switches, considered from the standpoint of prevention of injuries to trainmen and others?
2. What is the result of your experience and experiments as to the best manner of blocking frogs, guard rails and switches?
3. What is your opinion of the value of a blocking device such as is shown in the accompanying drawing, the same being made of wood or metal, and filling the entire space between the webs of the stock and guard rails, coming up to the bottom of the ball on the side next the stock



Blocking for Frogs

rail, then sloping downward and inward toward the guard rail about $\frac{1}{2}$ in., then horizontally toward the guard rail to a point $2\frac{1}{4}$ in. from the gage line, then sloping upward so as to come on a level with the center of the ball of the guard rail and extending over to the guard rail, fitting it snugly, the same device to be applied to wing rails, frogs and switches.

4. What is your opinion of the value of beveling the ends of guard rails, wing rails and foot guards with the view of reducing to a minimum the liability to accident from tripping against the ends of such guard rails, wing rails and foot guards?
5. Will you submit to the commission blue print or prints of foot guards which you have used and approved, with full explanation thereof, and suggestions for improvements therein, together with cost of installation per guard?
6. What suggestions have you to make as to the best method of securing adequate blocking of guard rails, wing rails, frogs and switches throughout the State, provided a suitable guard can be devised and is directed by the commission to be used?
7. What proportion of your frogs, guard rails, switches and wing rails are now blocked?
8. Any further information upon these subjects you are able to furnish.

THE OVERTHROW OF PREJUDICE

BY H. S. NEWTON, GENERAL MANAGER, HARTFORD & SPRINGFIELD STREET RAILWAY COMPANY

The breaking up of the popular prejudice against public service corporations, and the necessity for self-preservation prescribes that it must shortly be broken up, would seem in most localities where it exists to be a work of enlightenment and persuasion. It is customary to refer to the task as the education of the public. As a matter of fact, experience would seem to show that education or the making clear of the real facts is not sufficient. The demagogue has been building up a feeling of prejudice for a decade and this feeling has been strengthened so vigorously during the past few years by the speech and actions of men who are much in the public eye that it is a question whether education will not have to be followed by some inducement to be effective.

It is an error for the managements of city lines to consider that the popular feeling is in any way confined to their roads. The interurban road, and especially the New England interurban road, is made a punching bag for the buffets of public opinion to fully as great an extent, and is, if anything, often less capable of protecting itself than the city company. Leaving out of consideration the impossibility of the local head of an interurban road getting into as close touch with as large a proportion of the road's patrons as can be reached by the city man the solution of the problem would appear sometimes to be more difficult in the territory of the interurban road than in the city because of the number of authorities and governing boards, town, municipal and State, with which the road has to deal. The writer is familiar with one interurban road in the State of Pennsylvania where nine borough councils are factors to be reckoned with and where during his connection, lasting a period of years, he found it necessary to be on friendly terms with at least three-fourths of the members of these governing bodies. In New England the boards of selectmen, who are peculiarly susceptible to the pressure of public opinion, sometimes make the logical operation of a road difficult. This is especially the case when there is a considerable number of these boards and it is possible in the ordinary course of events, when adopting a new schedule or promulgating a new rule, to please highly one board while highly offending another. Add to the requirements of the selectmen the requests of the representatives, especially the newly elected ones, who are looking to promote the fancied interests of their constituents to the utmost of their ability, and you have a condition with more complications than the situations in the cities growing out of the existence of city councils or boards of aldermen can often present.

In the crusade for public enlightenment in which the electric roads must sooner or later engage, some fallacies will be unearthed among the people which are responsible for a great deal of the spirit of prejudice. Some of these are worth mentioning.

A widespread belief will be found that the railroad business, and especially the electric railroad business, is, from the nature of things, a vastly profitable one, capable in all times of bringing immense returns to its stockholders. Every man going to his work in the morning on a well-filled car has made a mental calculation as to the enormous receipts which such cars running throughout the day must bring to the corporation. If by any means this man has been shown that the cars are not always carrying

so many people at other times during the day and his figures are not, therefore, strictly accurate, he has at once with cheerful assurance ignored the logical conclusion and decided that if the road is not making immense profits it is because the capital stock has been watered to such an extent that the stockholders cannot reasonably expect to receive dividends and must, therefore, be content to carry on the business at a loss *pro bono publico*. Unfortunately, the part of his conclusion as to the existence of watered stock has in some cases been warranted, and this makes it all the more difficult for the legitimately capitalized and economically operated road to carry conviction in its attempt to make matters clear.

The problem will present itself of convincing the public that because the interurban road has been granted a franchise over the streets and highways of various towns or boroughs through which it runs, the holding of that franchise must not necessarily be a justification for all kinds of demands for unnecessary car service and uncalled-for public improvements. A franchise may have gone begging for years because there was no individual with enough confidence to build on it, but the moment it has been built on, it seems to become in the opinion of the public an asset of tremendous value. Allied to this belief is the opinion commonly held that a division or branch of an interurban road, even though it may be operated at a loss, should be compelled to give service equal to that on any other part of the system. Counsel for a town has been heard to advance and strenuously maintain in a hearing before a railroad commission, and with the applause of his clients, the doctrine that because an electric road was operating under a franchise granted by the people it should give a service which was satisfactory to the people whether this service was maintained at a profit or a loss. As in the case at issue the demand was that the time interval between cars be reduced by half throughout the year there was no difficulty in estimating whether the service would result in building up a surplus or a deficit.

A marked prejudice will also be found against foreign corporations, so called. It seems to be the exception for an interurban road in New England to be built, operated and controlled by capital residing in the country through which it passes. Often the owners reside in a neighboring city, sometimes they reside without the State. In either case the company becomes a foreign corporation and the disposition seems to be to deny it the fair treatment, indeed, the common justice which, were it a local enterprise, it might expect to receive. How strong this feeling is can usually be easily ascertained after a few moments' talk with one of the road's patrons.

A sentiment for municipal or State ownership will also be discovered. This exists to a less extent, naturally, in connection with interurban roads than with city lines. It forms too large a subject to be taken up in detail here.

A discussion of some of the measures which may to some extent avail in an interurban road's attempt to down these fallacies and others not mentioned is the purpose of this article. Many of the recommendations advanced may appear so obvious as to be commonplace. Most of them have been tried out by the writer, however, in a long experience and may serve, if nothing more, as reminders of the methods used, and perhaps forgotten, by the reader in other fields.

THE PRESS

It is impossible to conceive how much can be done in the line of public enlightenment against the opposition or

even without the co-operation of a majority of the local newspapers. Yet, strange as it may seem, there are numerous roads to-day which make no systematic attempt to get the newspapers into line. The editorial pages and the news columns of the dailies published in their territories are given up very often to critical, or worse yet, humorous, comments on local conditions and the local managements. As a general proposition, it may be said that it is a very great mistake to allow a single newspaper in the territory served, if it can be avoided, to take a position as an enemy of the road. Even the yellowest sheet, with no reputation for veracity and a big one for libellous utterance, will carry conviction to many.

Every interurban electric road should do some newspaper advertising, whether it pays from a traffic-making standpoint or not, and this advertising should be carefully distributed among the local papers. By such plan, discreetly followed, and by good treatment of the reporters, the writer has on several occasions been able to get up real enthusiasm toward his road in the local papers when exploiting a new park or introducing an improved service. This has resulted in his being able not only to secure space in the news columns for a great deal of matter at a small cost, but through frequent contact with the newspapers' representatives has brought about a more cordial and warmer feeling toward the road.

The newspaper is most often, and naturally, the mouth-piece of a faction or the organ of a political party. When party strife separates the press into two or more camps, it is usually of immense consequence that the railroad shall have, as a corporation, no political tendencies and shall take no part in the campaigns. This attitude is sometimes difficult to maintain, but the writer has proved on several occasions that a neutral ground is far the safer one, even though the benefits to the road may seem to rest entirely with one side.

It will be found that nine out of ten newspapers are reasonable and upright in their dealings, and are ready, if given half a chance, to take up the cause of a maligned railroad. They will often fight as strenuously for the road as they will fight against it if only they can be shown that the cause is worth fighting for. With the thought of conciliating the press in mind, it is a mistake to ask the newspapers to print in their news columns, without compensation, stale news or hackneyed advertising matter, but it is not a mistake to see that they are all furnished promptly, by some one whose business it is to do so, with every bit of real news which happens on the road. With the popularity of the road among all newspaper readers at stake, it is a mistake to see that one paper is taken care of, while the others are left to ferret out the news themselves. Things are constantly occurring on an electric road which have a decided news value, and no man appreciates a square deal more than your newspaper man, and no man is more ready to give you one in return. It is well to remember, too, that although the newspapers must print news, they are usually quite willing, if asked, to discriminate between news and the idle gossip which is sometimes given space and so often hurts the road.

The irresponsible local correspondent or the sometimes more irresponsible reporter, who gathers up the news from the small suburban towns and villages through which the road passes, sometimes gets a "trolley knock" in the paper, because it is a good story and no one takes sufficient interest to keep it out. If the city editor really appreciates the situation, however, and if the railroad management is in

touch with him and his chief, the irresponsible reporter's good story won't go. A tactful story given to all the boys and published simultaneously by all their papers has been known to veer public opinion right around. A campaign of enlightenment carried on by the newspapers naturally cannot fail to impress the public and make it conscious of unjust treatment toward a public service corporation if such has been the case.

THE MAN ON THE CAR

It is seldom—in fact, so seldom as to be the exception—that the man on the car gets a training from his company which will make him a pronounced factor in the electric road's popularity with the people. He usually is the instrument solely for turning on the power or taking up the fares, but is of no positive value in smoothing out the relations between the company and the public or in fighting some of the battles which opportunity gives him a chance to wage every day. When we consider what a number of agents a company might have in its conductors and motormen to rally to its support in times of stress, were the men ready and prepared to fight its battles, it is a cause for wonder that nothing more has been done in this line. The extent to which your conductor, especially, can get in touch with the public, if he sets out to, is wonderful, and if he can be made to exchange his habitual indifference for a strong pro-company feeling, he will accomplish great things.

The rather strained relations which so often exist between the management and the employees' labor organizations are probably quite often responsible for the lack of initiative on the part of the men in fighting the company's battles. The time has passed, however, when a good railroad management has often to suffer such a condition to exist, and, with everything smoothed over and good feeling restored, there is no reason why a little education of the employees should not result in the corporation making a large advance in public favor. A man whose intelligence is so limited that he cannot comprehend to some extent the details of railway costs should have no place on a car. With these costs in mind, the motorman or conductor of intelligence is prepared to put up an argument with the public he rubs up against which will carry conviction.

Few roads insist on the degree of courtesy and good manners from their men toward the public which the public should have a right to expect. A correction of this difficulty will be found to be one of the largest factors in persuading people that the company is not a predatory institution. The inspection of the operating force on some lines will often lead to the reflection that there is hardly as high a grade of intelligence and morals represented as might be secured for the wages paid. Aside from the many other reasons why the bum and the degenerate should be kept off the cars, the fact that they are to come in contact with the public and are to help mold public opinion toward the road should be a specially convincing one.

Frequent meetings between the management and the men, when the details of cost of maintenance, power and transportation can be discussed, should be held. At such meetings the reasons why fixed charges must be a factor, and why depreciation, a sinking fund and other things should be allowed for, could be explained. On the usual occasion when the management and the men get together to promote good feeling it is the custom for a company official to make a condescending address, full of common-

places and platitudes, and often of doubtful value. It goes against the grain of the American employee to be patronized. A heart to heart talk is far more effective, and the influential men among the employees, if enlisted in the cause, will help out amazingly in convincing the others that they should not withhold their assistance.

THE MAN IN THE OFFICE

The public often has trouble in seeing the manager with its complaints. This is a mistake. The manager of an electric road should be as approachable as any business man who wants to sell goods. He is not caring for his own property, but for that belonging to others. This consideration should cause him to be, as far as possible, accessible to every person who may have a complaint or a suggestion to make. There is, of course, a limit to his endurance in this line, but he should know casually a large number of his patrons and should know all of whom it is wise to know. It can be demonstrated to a certainty that the "state your business to my secretary," "take your card," "wait in the anteroom" type of manager is poorly adapted to amalgamate with the public. The secretary may be the man to whom the visitor can be safely turned over after he has been received, but he should first be received. Indeed, the railroad manager should be a technical man, an executive and an economist, but, most of all, he should be a mixer, a companion among his fellow men. Too often a company has suffered in favor with the public solely because its chief representative was unable to assimilate with the people it served.

The public has always but a faint idea of the real cost of operating a road. It should be primarily the manager's duty to enlighten the population his road serves. Endless opportunities occur; public addresses, newspaper interviews, talks at the clubs, after-dinner speeches—all are occasions when the cost of power, maintenance and labor may be dwelt upon, and men made to see how expensive to the corporation the trolley accommodations are. With the foreign corporation, especially, where the president or other officers are not available for information, it should be peculiarly the manager's province to advertise these figures and persuade the community that they are getting value received. The one phase of the situation which the man in charge, if he fits his place, can generally make clear to the man of business is that good service, a smooth track and clean cars demand a prosperous road—one which has revenues sufficient to pay for the labor and material to keep things up as well as to pay dividends and fixed charges. This point, self-evident as it is, will usually prove to be a particularly effective one in a discussion with a hard-headed business man.

From the manager should come the incentive, if the employees are expected to play a part in the enlightenment of the public. He should be close to his men; occasions arise when he needn't lower his dignity by consulting with them. On all but the largest properties he ought to hire them himself. If he is not fitted by previous training to do this with better results than any of his subordinates, there is a question if he is fitted to hold his post. The attitude of the man in the office toward the operating force is a true gage of the attitude which that force may naturally hold toward the public. Cordiality, which has the true ring and is free from condescension, shown by master to man is apt to be reflected by man toward the public on the cars.

It is a question whether the time has not come when the preservation of our public utility corporations and the con-

quest of public prejudice does not call for larger concessions to local interests. In other words, it has become pertinent to ask whether the old practice of transferring a single share of stock to a prominent local man, to be re-assigned on demand, with the understanding that this man shall act as a nominal director, could not profitably be changed for the plan of really turning over to local men, at a concession perhaps, substantial interests, which will warrant their active co-operation. Undoubtedly this plan is not new, yet it is one which certainly is not always followed. Nevertheless, to the writer's knowledge, it has not been pronounced a failure in a number of instances in which it has been tried.

It would seem to be a foregone conclusion that with the directory of an interurban road made up of men of real influence and substance, one from each community along the line, a great many of the difficulties which come up with the traveling public would be easily smoothed out. A man can usually convince his neighbor more easily than he can a man in the next town if he and that neighbor are on good terms, and it is the man who is on good terms with his neighbors who should be chosen for the board. It might be urged that men of this class, being entirely unfamiliar with the details of railroad operation, might in some things be a serious handicap to the local operating head. This, however, could be regulated by the choice of men and by a little tact on the part of the operator. There is always a possibility, also, that members of such a board will take only a perfunctory interest in things, notwithstanding the fact of their stock holdings. This possibility, however, can be made slight if this interest is substantial enough to warrant their spending the time. It is conceivable, also, how a board of this kind might become unmanageable, but this could always be regulated at the annual meeting, and usually by a few practical suggestions from the men among the members who had had some real railroad experience.

People can be found who say that the pendulum has swung to its limit, and that from now on the prejudice against corporations of all kinds will subside. The writer's observation goes to show that this is not true in New England. The farming communities here, influenced no doubt by the bitterness born of bad times not yet entirely over, are still embarrassing interurban roads by unjust and arbitrary demands. The knowledge that earnings on these roads have decreased, owing largely to the lack of patronage from these farmers, in no way reduces their exactions. The "no limit" quality called for in the public accommodation is taken as a matter of course; arguments as such are of small account. That an organized attack on public prejudice, however, made on the lines just laid down might succeed even with the farming population seems probable. Prejudice is usually proof against logic, but will not always stand up against persuasion when administered tactfully and not in too large doses.

The Sublime Porte of Turkey has rendered an important decision on the granting of concessions and franchises for public utility enterprises by local city governments. One of the suburbs of Constantinople applied for permission to build a municipally owned tramway system. The Minister of Public Works has decided that such privileges cannot be granted to communal authorities either in Constantinople or in the provinces, as they would be lacking in both financial strength and technical experience to carry out such an undertaking.

BULLETIN ON THE DENVER CONVENTION

The American Street & Interurban Railway Association has issued the following preliminary bulletin on the Denver convention:

PLACE OF MEETING

The annual convention of your association will be held at Denver, Colo., on Monday, Tuesday, Wednesday, Thursday and Friday, Oct. 18, 19, 20, 21 and 22, 1909. The days upon which the different associations will hold their meetings have not been definitely decided, but this matter will be arranged in the near future.

At the midwinter meeting of the executive committee of the American association, held in New York City on Jan. 29 last, the subject of the 1909 convention city was given much attention. After considering the matter from all standpoints it seemed to the committee, inasmuch as the conventions of the past several years have been held in the East, and being mindful of the fact that the Western membership of the association represents about 20 per cent of the total, and also realizing that these Western companies have been most generous in their attendance at the Eastern conventions, that the welfare of the association could best be served and the Western companies given the consideration which is their due by holding the 1909 convention in some city west of the Mississippi River. A convention location committee was then appointed, and this committee, accompanied by a similar committee from the Manufacturers' Association, visited Denver and other Western cities in an endeavor to decide upon the city which this year seemed the logical meeting place. From the standpoint of hotel accommodations and other matters of interest to visiting delegates, all the cities considered have qualifications peculiar to themselves, but, in view of the fact that Denver had in 1908 made a strong plea for the convention, and again this year had extended a warm invitation, the committee finally decided upon that city, as stated above.

The selection of Denver has already aroused a great deal of enthusiasm among many of our Eastern members, and there are many reasons why this should be so. A number of conventions have been held in Denver in the past few years, and reports from all those who have had to do with such conventions have been in most hearty commendation of Denver's facilities, willingness and ability to make the stay of all who visit their city most pleasant and profitable. Its great electric railway system, its climate and its location in the heart of Colorado, and the opportunity thus afforded of visiting many famous points of great natural beauty are well known, and our members are already looking forward to this trip as being one which will prove enjoyable and profitable in the highest degree.

HOTELS

While detailed information will be given in later bulletins as to hotel locations, rates, etc., it is thought well at this time to call attention to the splendid facilities offered by Denver in his direction. Twenty of the best hotels, practically surrounding the convention halls, provide 1600 rooms, many having baths attached, and 40 other good hotels are in a position to furnish 1000 additional rooms, while ample assurance has been given that the hotel rates during the convention period will be most satisfactory to the delegates.

EXHIBITS OF THE MANUFACTURERS' ASSOCIATION

The exhibits provided by the Manufacturers' Association must always prove of immense interest to those attending our conventions, and it is felt that this year, with the exhibit room provided in the new Denver Auditorium and adjacent space, together with the recent great development of the electric traction industry in the Western country, and the keen interest already shown by the Western companies in the coming convention, the exhibits will prove fully as extensive as those of previous years. This supposition is also borne out by the number of letters received from manufacturing interests when the consideration of Denver as a convention city was first suggested, all of these being of an enthusiastic tone as to the advantages to be derived from the selection of a Western city for convention purposes.

Later convention bulletins will contain full information with regard to hotel and railroad facilities, convention halls and manufacturers' exhibits, together with other facts of interest concerning locations of hotels with reference to exhibit halls, etc.

It is firmly believed, considering the already expressed sentiment of many Eastern companies and the cordial support assured by the Western companies, that the 1909 convention is bound to prove one of the most successful in the history of the association.

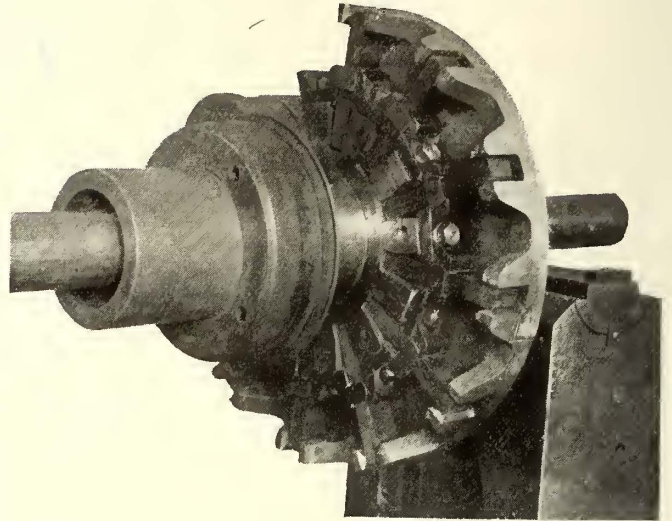
A NEW SIDE-ROD ELECTRIC LOCOMOTIVE

The accompanying illustrations show the principal features of a novel type of electric locomotive which has recently been designed and built jointly by the General Electric Company and the American Locomotive Company. The distinguishing feature of this locomotive is the fact that the motors are mounted on top of the frames and are connected to the driving wheels by rods and cranks instead of having the armatures geared to or mounted directly on the driving axles. The locomotive is designed to carry two 800-hp, single-phase, 15-cycle motors, and with this equipment will develop a tractive effort of 30,000 lb. at a speed of 18 m.p.h. The motors are capable of driving the locomotive at a maximum speed of 50 m.p.h. and will operate equally well when running in either direction. The locomotive has been equipped temporarily with two 400-hp motors for testing purposes, and the illustration from a photograph shows these small motors and a temporary cab in place. It is the intention to build a cab over the entire length of the machine as shown in the illustration on the opposite page.

The frame and running gear are very similar to those of steam locomotives. There are three pairs of coupled driving wheels 49 in. in diameter, a radial two-wheeled pony truck with wheels 36 in. in diameter at one end and

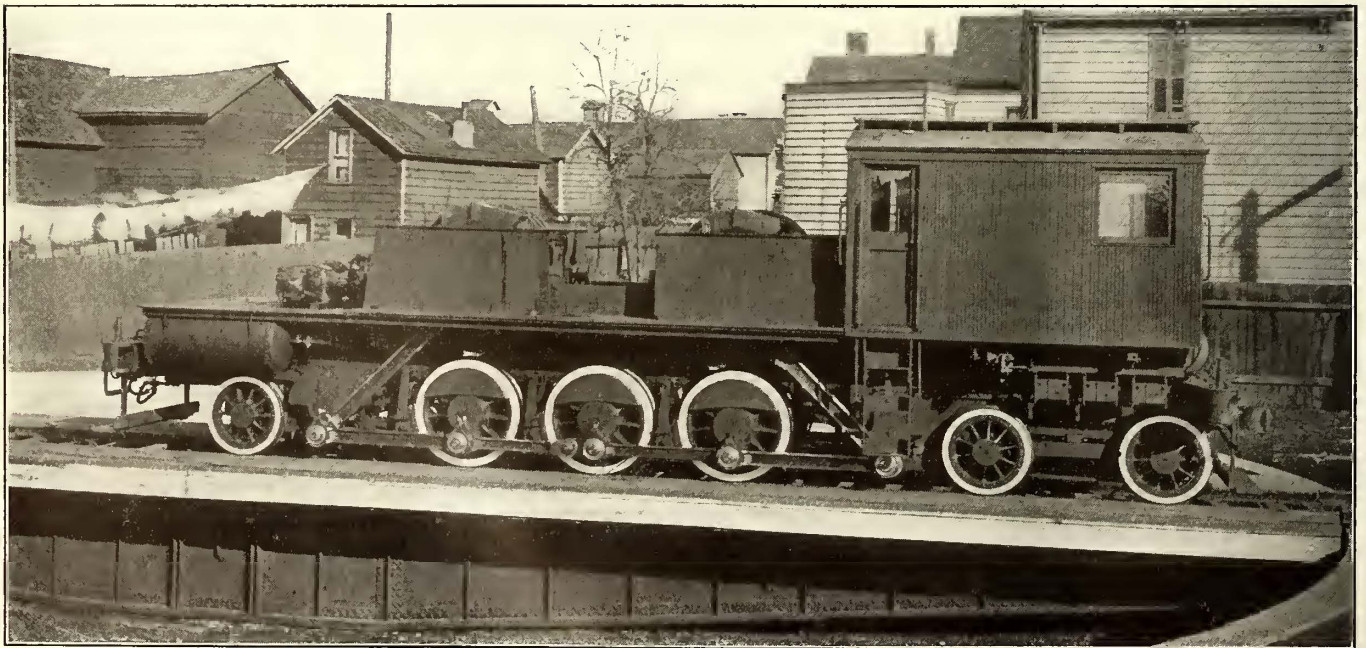
is unsymmetrical by reason of having a pony truck at one end and a bogie truck at the other, the locomotive is adapted for running in either direction. Preferably it would be run with the bogie truck in front.

The system of spring supports is equalized between all six wheels on each side and is also cross equalized. The pony truck at one end has a radial center bearing and is



Flexible Coupling Between Motor Shaft and Crank Arm

guided by two radius bars, which are pivoted at the center of a cross piece between the frames forward of the rear driving wheel. The total weight of the locomotive when equipped with two 800-hp motors will be 250,000 lb., of which 162,000 lb. will be carried by the three driving axles. This gives a weight per driving axle of 54,000 lb., which is slightly less than the maximum weights employed on high-speed steam locomotives, but is much higher than the



Side-Rod Electric Locomotive as Experimentally Equipped with Two 400-hp Motors and Temporary Cab

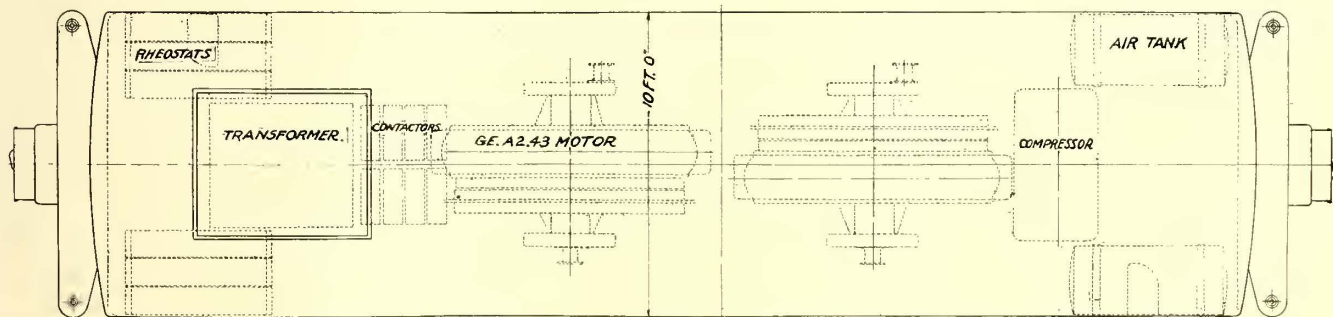
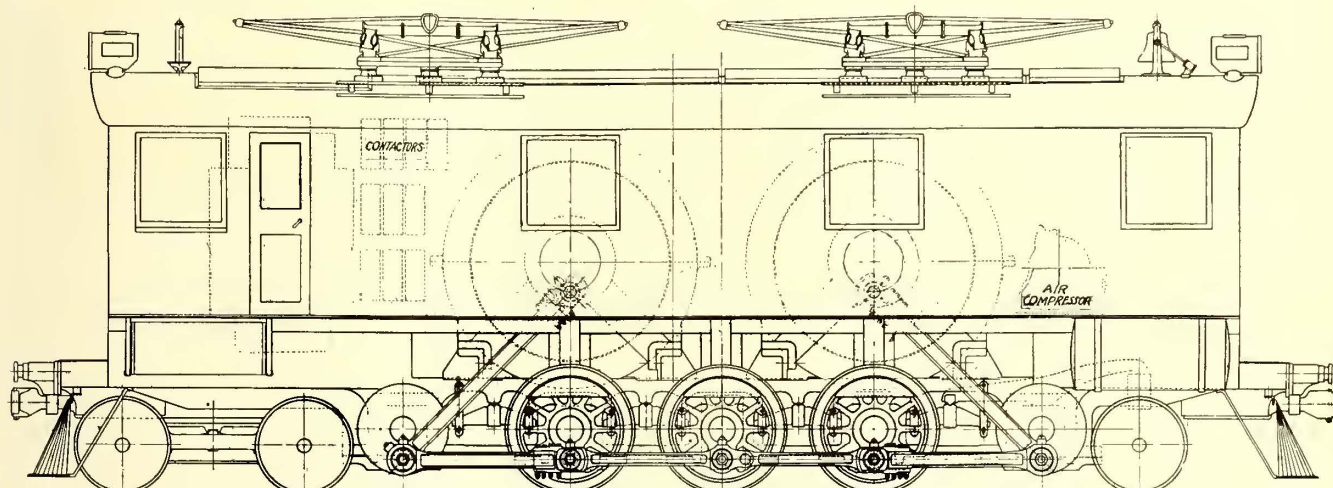
a four-wheeled bogie truck with 36-in. diameter wheels at the other end. The total wheel base of the locomotive is 36 ft. 3 in., but the rigid wheel base is only 10 ft., which will permit rounding the sharpest curves. This wheel arrangement corresponds to what is commonly known as the "Pacific" type in steam locomotive practice, and while it

weights on either the New York Central or New Haven electric locomotives.

The two 800-hp motors which are mounted on the locomotive are of the GEAZ-43 type, designed for operating on 15-cycle, single-phase current. The electrical control is arranged so that the motors start as repulsion motors with

short-circuited armatures and are changed over to series repulsion motors as the speed increases. This arrangement eliminates running with a short-circuited armature on high voltage and gives the motors a high torque at starting. The tractive effort is about twice as great when running as repulsion motors as when running as series repulsion motors for the same current input. The armatures are similar to those of an ordinary direct-current motor with equalizer rings. The windings are of the multiple-drum type, with the bars soldered directly to the commutator segments. The field or stationary windings are of the distributed type and are made in two sections, the exciting and the inducing windings. The exciting winding has the same function as the field winding in an ordinary series motor, while the inducing winding produces the high working torque when the motors are connected as repulsion motors with short-circuited armatures at starting.

The arrangement of connecting rods between the motors and the driving wheels is well illustrated in the engravings. Two jackshafts, 10 in. in diameter and supported in bearings rigidly fixed in the locomotive frames, extend across the frames outside of the end driving wheels. Quartered crank arms are shrunk and keyed on both ends of these jackshafts and similar crank arms are attached with flexible couplings to both ends of each motor armature shaft. Inclined connecting rods extend from each motor crank arm to the corresponding jackshaft crank. To the same crank pins on the jackshafts are connected the driving-wheel side rods. For each revolution of the motor armatures, therefore, the driving wheels make one complete revolution and the two motors revolve in exact unison, due to the mechanical connection through the driving-wheel side rods. The object of inserting the jackshaft as an intermediate connection between the motors on top of the frames and



Side Elevation and Plan of Side-Rod Locomotive as Equipped with Two 800-hp Motors and Cab

The motors are mounted on top of the frames and this permits using armature bearings of exceptionally large size. With large bearings there is no danger of the armature dropping on the pole pieces, and hence the air-gap can be reduced to a minimum. The entire weight of the motor field and the armature, being carried on the frame of the locomotive, is spring supported, and therefore no severe shocks are produced by dead weight carried on the axles. The location of the motors close together near the center of the frame concentrates a very large proportion of the total weight of the locomotive over the driving wheels, and there is the further advantage that with the weight concentrated near the center the moment of inertia of the entire locomotive around its vertical axis is reduced to a minimum. This tends to lessen the lateral rail pressure on the truck wheels, and consequently the wear on the wheel flanges and the rail head.

the wheels is to permit a horizontal drive between the spring-supported part of the locomotive and the driving wheels. This is necessary in order to provide for vertical play between the spring-supported part and the non-spring-supported wheels with a negligible variation in the distance between crank centers. Counterweights are cast in the driving-wheel centers radially opposite to the side-rod pins and the crank arms on the jackshafts are similarly counterweighted. The jackshaft counterweights, however, are of such mass and their center of gravity is so located as to counteract the resultant forces produced by the revolution of half the mass of the inclined motor connecting rod and half the mass of the horizontal side rod between the jackshaft and the first driving wheel.

A very interesting mechanical detail of the locomotive is the flexible coupling inserted between the motor armature shaft and the motor crank arm. The motor crank

arm and its counterweight are formed in one piece, which is bored out to fit over an extension of the motor armature shaft. Just outside the armature bearing the armature shaft is enlarged in diameter, and notches are cut out to form seats for eight sets of radial leaf springs. On the inside surface of the crank-arm counterweight suitable notches are formed to seat the other end of the leaf springs. The sets of springs are fastened to the counterweight by bolted lugs which fit over the spring bands. The entire set of springs is designed to be of such strength as to carry the entire torque of the motor flexibly with an amount of deflection which will reduce the effect of the pulsating torque of a single-phase motor to a minimum.

The controller in the cab of the locomotive is mounted in the end over the bogie truck. The operator thus has a clear and unobstructed view ahead. Immediately back of the controller is mounted a static transformer, and back of it the multiple-unit control switches. On the deck at the opposite end of the locomotive, over the pony truck, is mounted an air compressor for the braking system, and under the deck two large main reservoirs. This arrangement of auxiliary apparatus gives a good distribution of weight, and at the same time permits of easy access to all parts of the machine from the cab.

The locomotive has been thoroughly tested up to its maximum speed on the General Electric Company's experimental track at Schenectady, and the tests have demonstrated conclusively that the design is entirely satisfactory, both mechanically and electrically. It is believed that owing to the motors being located in the cab, where they may be easily inspected and adjusted, and also where they are out of the way of all dust and other foreign material, the maintenance charges will be greatly reduced. The design permits the use of driving wheels of small diameter and motors of comparatively large size. It is equally well adapted for the application of direct-current motors, single-phase motors or three-phase motors.

CHIEF ENGINEERS' MEETINGS IN BOSTON

The Boston Elevated Railway Company has begun to hold regular monthly meetings of the chief engineers of its power stations, corresponding to the meetings which the company also holds with its division superintendents and car-house foremen. It is proposed to appoint subjects for discussion which will lead toward a reduction in operating costs and the improvement of the power station service in general. Tabulations of the cost of production at the different plants will be prepared regularly, including comparisons of the current performance of each station with previous operation, and the contrasting of conditions and operating results in the several plants. The company at present operates eight steam and two gas-engines plants of a normal capacity of 50,000 kw. The operations of these stations are under the jurisdiction of a superintendent of power stations, reporting to the chief engineer of motive power and rolling stock. At the initial meeting in April a general discussion of operating conditions in the different plants was held, after which the purpose of the meetings was explained by Paul Winsor, chief engineer of motive power and rolling stock. James D. Andrew, superintendent of power stations, presided, and J. Henry Neal, general auditor of the company, pointed out the importance of accurate records of cost and the value of co-operation between all departments of the company in securing the most efficient results.

RESULTS OF A STUDY OF CAR VENTILATION IN CHICAGO

INTRODUCTION BY W. A. EVANS, M.S., M.D., COMMISSIONER OF HEALTH, CHICAGO, ILL.

REPORT OF TESTS BY J. F. BIEHN, A.M., M.D., AND J. B. GOOKEN, S.B., DEPARTMENT OF HEALTH, CHICAGO, ILL.

The introduction of large, modern street cars, differing radically in construction from the older types of cars, which had no platform protection and were not built with tight doors and windows, has created a necessity for installing some positive means of ventilation. With the old cars, which permitted passengers to enter or leave by either the front or rear doors, a large volume of fresh air entered whenever the doors were opened before coming to a full stop. The leakage through the end doors and bulkheads, the monitor sash and the loosely fitted side windows also supplied an excess of fresh air. In the new cars, such as are being operated in Chicago and other cities, the front platform is entirely enclosed and the exit door is not opened until the car has come to a full stop. This adds to the safety and comfort of passengers, but at the sacrifice of natural ventilation.

The principles of ventilation of street cars differ from those obtaining on steam railroads or high-speed interurban electric cars running through open country. The writer is of the opinion that enough fresh air will enter through leakage around the doors and windows and other ordinary ventilation devices in a sleeping car when running in a train at reasonable speed to supply the needs of the passengers constituting the ordinary sleeping-car load. The average load carried in a street car during the crowded hours is larger than that carried in steam cars or interurban cars, and the speed at which the cars are operated is much less. Hence the ventilation due solely to the velocity of the car is quite inadequate. When 100 passengers are crowded into a street car there is but 10 cu. ft. of space in the interior for each passenger, after due allowance is made for the space occupied by the seats and the bodies of the passengers. For proper ventilation it is necessary that the air should be changed frequently; three times per minute if the fresh air and the foul air are mixed, and less often in proportion as they are kept separate. This necessity for frequent changing of the air underlies several of the principles which govern proper and adequate ventilation for street cars.

A street car does not run with sufficient velocity to force through the ordinary ventilator openings enough air to supply the needs of the passengers. This method of natural velocity ventilation, which works satisfactorily in cars running in steam railroad trains, is not suitable for application to street cars. When the weather is cold enough to require the windows to be shut tight, passengers will ordinarily object to the admission of enough cold fresh air through the ventilators to supply their needs, especially if the openings are located so as to produce direct drafts on the passengers. It is essential, therefore, that the incoming air be heated as it enters the cars. The ordinary method of heating by direct radiation from heaters placed under the seats is usually ineffective, because the body and clothing of the passenger and the seat and the side of the car form a closed space which confines the heat under the seat.

If the foul air and the fresh air are mixed together, the ordinary car will require about 400,000 cu. ft. of fresh air per hour. To heat such a volume of air on a cold day is

expensive; it also would require the installation of bulky apparatus, which would occupy much valuable space. The only feasible plan is to reduce the amount of fresh air required by keeping it separated as much as possible from the foul air. To this end the outlet openings should be in the deck sash and the inlets near the floor line. Methods for accomplishing proper ventilation in this way are described in the following discussion by Dr. Biehn and Mr. Gooken. The principles involved are applicable to any car, and this method of ventilation should be enforced from the time when the temperature falls low enough to cause the windows to be shut tight until warm weather arrives and the windows can again be raised.

VENTILATION EXPERIMENTS BY MESSRS. BIEHN AND GOOKEN

Within the past two years the Board of Health of the city of Chicago has made a careful and scientific test of existing conditions of ventilation on surface, elevated and steam railway cars. The system in most common use depends on opening the deck sash. On the cars in Chicago these deck-sash ventilators are rarely opened in cold weather, as the railway companies are required by city ordinances to heat the cars to a temperature of 52 deg. F. in all weather conditions. The general practice is to keep the ventilators and doors closed whenever the heat is turned on in the cars. Tests were made to determine the efficiency of deck-sash ventilators. These tests consisted of taking anemometer readings to determine the volume of air entering and leaving the car through the ventilators; filling the car with fumes to determine the direction of air currents, and the diffusion of the incoming air and the time required to change the air in the car.

The results obtained in the first tests with deck-sash ventilators turning on a longitudinal axis showed 560 cu. ft. of air per minute leaving through the ventilators when running at average speed and 805 cu. ft. entering. The time required to clear the car of all fumes was 4.5 minutes. The greatest efficiency possible in this type of ventilator was calculated as follows: Amount of air entering the car through ventilators, 48,300 cu. ft. per hour. As this is a dilution system, 300,000 cu. ft. per hour are required for proper ventilation with a load of 100 passengers. The ratio of actual ventilation to theoretical ventilation required, therefore, is only 18.37 per cent.

Deck-sash ventilators hinged at one end are even less efficient. Tests with this type showed that only 10.24 per cent of the required volume of air is admitted to the car. The effect of opening the door when the car comes to a stop is equivalent to nearly 26 times the action of deck-sash ventilators. This action, however, is not true ventilation, because it is not constant. The first pay-as-you-enter cars in service in Chicago were equipped with ventilators having an area of 190 sq. in. in the rear and front of the monitor hood on a level with the deck sash. The air was supposed to enter through the front ventilator, pass down through the car and out at the rear ventilators. Tests showed that this action was not found in practice.

As a result of the experiments made by the Board of Health, certain standards of car heating and ventilation were determined upon and submitted to the Board of Supervising Engineers. These standards are as follows:

At least 28,000 cu. ft. of air per hour must be supplied to each car. This air must enter at or near the floor line from as many points as possible, primarily to give a proper distribution, and, secondly, to prevent drafts. This air must be heated as soon as it enters the car and the foul air must be removed at or near the ceiling, and from as many points as possible. The temperature in the car shall not

be over 52 deg. F. A temperature of 41 to 45 deg. F. is considered high enough, as the passengers have on heavy clothing and overcoats. Some heat is required, however, because if the air is not warmed it will be more readily noticed as a draft, and as the passengers are not exercising, they will require a somewhat higher temperature than if they were walking in the outdoor air.

The standard temperature, it is believed, can easily be maintained with a method of ventilation in which the fresh air is admitted near the floor line and foul air exhausted near the roof. It is plain that by passing the incoming air over the heaters under the seats the efficiency of the heaters is increased at least 400 per cent.

When the proposed standard requirements for heating and ventilation of street cars were submitted to the Board of Supervising Engineers of Chicago Traction, the members of the board said that they knew of no ventilating system which would meet the requirements. The health department then offered to make tests with any system which the Board of Supervising Engineers would install. Several manufacturers of ventilating apparatus were invited to submit plans, and five systems were installed on five of the latest pay-as-you-enter cars. Tests were made of all of these devices and a report submitted to the Board of Supervising Engineers. A brief description of each of the systems tested and the results obtained is given below:

TAYLOR SYSTEM

The Taylor automatic ventilator consists of two interior bronze diffusion boxes and a brass exterior panel, which is inserted in the deck-sash openings, six on each side. The deflector, which is composed of chilled steel, extends 8 in. from the deck sash and is 7 in. high. The outer end is bent to the front and rear. When the car is moving fresh air is forced into the car through the forward openings, the deflector forcing it into the rear. On the other side of the deflector a partial vacuum is caused, which is intensified by the overhanging portions, thereby exhausting the vitiated air. The openings in these boxes are 6 in. x 8 in., and are covered with a coarse screen. Each opening is fitted with five stationary louvres which extend upward at an angle of about 45 deg. In addition there are six intake openings on each side of the car 5 in. above the floor line. These openings are 4¼ in. x 6¼ in. and fitted on the inside with ordinary register faces. They are placed under the seats and the fresh air entering through them passes through the heater coils. A V-shaped deflector is hinged by a steel pin to the outer edge and outside of the car. When the car is in motion the wind opens the forward end of the deflector and closes the rear end. Ventilators are also installed in the vestibules.

When this system was first tested out the lower openings at the floor line were not in use and the railway company claimed that dust would enter through these openings. Experiments were therefore made to determine how high the dust of the street rises when disturbed by street cars. It was found that the dust showed a tendency to move away from the cars. The wind assisted this material and the dust did not deposit along the side of the car, the speed of the car and its direction always being away from the swirl of the dust, which is left behind. Air exhausted from the brakes under the car body did not raise the dust higher than the floor line. Dust raised by the wind and by wagons passing along the street, which may be blown into the car, it was found, was not more abundant at the floor line level of the car than at other levels higher up.

With the Taylor system a test made Dec. 2, 1908, showed that a total of 32,062 cu. ft. of air per hour entered the

car. The diffusion was very good and the temperature was maintained without difficulty. When the car was standing still on one occasion 13,100 cu. ft. of air per hour entered. Some other observations did not show as high a reading. This system depends largely upon the direction and velocity of the wind and the speed of the car.

PERRY SYSTEM

The next system tested was the Perry system. This ventilator fits into the monitor top. It consists of a number of copper ribs or louvres extending out from the car for a distance of about 3 in. These louvres are curved downward and the space between them on the inside is half closed by bending them back upon themselves so as to form a dead air space. The fresh air is forced into the car when under motion through the vertical openings so as to pass under the deflector plates before being taken into the interior. The air takes an S-shaped course before it enters the car. It is claimed that the impurities, such as dust, smoke, etc., as well as rain and snow, are drawn under the deflector and forced out through small openings on the side of the ventilator. When the car is in motion at the forward end of the ventilator there is a strong outward current of air and at the rear end of the ventilator there is an inward current.

The car tested had eight ventilators, four on each side, two in the front part of the car and two in the rear. The total amount of air taken in, as nearly as could be determined, was 13,043 cu. ft. per hour and the total exhaust 28,133 cu. ft. per hour. Intake and exhaust of air varied directly with the direction of the wind and the velocity of the car. The tests showed that the purification was limited to the upper part of the car. This is a dilution system and does not introduce sufficient air into the car.

GARLAND VENTILATORS

The third system tested was the Garland automatic. The Garland ventilator is fitted to the roof of the car at the deck sash. It consists of two funnel-shaped ducts so arranged that the velocity of the car causes air to pass into one duct and out of the ventilator at right angles to the car. Foul air is drawn through another duct that communicates with the exhaust portion of the ventilator as a result of this rush of outside air by the opening. This is practically a double cowl so arranged as to operate whether the car is moving in one direction or another. It is a vacuum or exhaust system. The amount of air exhausted depends upon the speed of the car and the area of openings or cracks and crevices in the car through which the air is taken in. On opening a door the exhausting power was about double, the small natural openings in the car offering too great a resistance to allow sufficient ventilation. Without special intake openings this system is not efficient, as the air supplied must come through accidental openings, which are not evenly distributed and which are almost entirely eliminated by modern car-building methods. This system exhausted 18,896 cu. ft. per hour under usual conditions. With the rear doors opened when running at the same speed as in the previous test an exhaust of 53,664 cu. ft. per hour was recorded.

M'GERRY SYSTEM

The McGerry system consists of two separate but identical fan sets installed at opposite corners of the car under the longitudinal seat. These fans are driven by 1/2-hp motors enclosed in a sheet-iron casing. The motor has a long shaft, one end of which is fitted with a suction fan and the other with a blower fan. The suction fan is connected to a wooden duct which runs up in the corner of the car

and terminates in a 7-in. x 7-in. opening directly under the deck rail inside the car. Through this opening the foul air is drawn down and expelled below the floor of the car. The fan on the opposite end of the motor shaft is connected by a galvanized iron tube to an opening on the outside of the car 5 in. x 8 in. in size, near the corner post of the car and about 5 ft. above the platform level. Fresh air is drawn through this opening by the fan and is forced over the heater coil. It is then discharged into the car at various openings under the car seats, being conducted along the side of the car at the floor line by a sheet-iron duct. A duplicate system is installed on each side of the car. The best results obtained with this system were shown on a regular trip in which 22,237 cu. ft. of air entered the car through the ventilators and 11,582 cu. ft. were exhausted. In this system there are only two exhaust points near the ceiling, one on each side of the car at the end of the car. These are not sufficient.

COOK VENTILATION SYSTEM

The Cook vacuum system consists of a motor-driven exhaust fan located at one end of the car roof. The air is taken into the car at the floor line, passes over the motor coils and rises in the car to be exhausted at the ceiling through a plenum chamber between the roof and a false ceiling. The fan is connected directly to a 1/3-hp motor driving a fan 10.5 in. in diameter and 3 in. in width at the periphery at 2100 r.p.m. The sectional area of the plenum chamber increased in size with the distance from the motor. There are also openings for exhausting the air in the vestibules. The foul air is exhausted from the body of the car under a partial vacuum. Tests of this system showed an exhaust of 47,524 cu. ft. from the body of the car, 2983 cu. ft. from the front vestibule and 3969 cu. ft. from the rear vestibule, making a total of 54,476 cu. ft. of air per hour. The diffusion with this system was very good, but owing to the air entering at the four corners and only passing over four heaters, it was not possible to maintain the desired temperature. This can be remedied, however, by placing all of the heaters above the air intakes or by increasing the number of intakes and placing one under each heater. The latter arrangement is preferable.

The McGerry and Cook mechanical systems deliver a uniform amount of air. The variations are due only to variations in the voltage. The direction of the wind and the speed of the car do not affect the amount of air supplied.

DISCUSSION OF CAR HEATING BY DR. EVANS

A large pay-as-you-enter car heated to 52 deg. Fahr., running when the outside temperature is 0 deg. Fahr., will radiate 18,300 B.t.u. per hour from the sides, floor and roof. One hundred passengers will generate 38,000 B.t.u. Subtracting from this the 18,300 B.t.u. radiated, it will be seen that the passengers will not only make up the heat radiated from the car, but will contribute 19,700 B.t.u. toward the heating of fresh air. If 38,000 cu. ft. of air are taken in at 0 deg. Fahr., 34,544 B.t.u. are required to raise its temperature to 52 deg. Fahr. Subtracting the 19,700 furnished by the passengers leaves 14,844 B.t.u. as the amount of heat required to be furnished by resistance coils. Thus the cost of heating the car would be 6.4 cents per hour assuming that current costs 1.5 cents per kw-hour at the car.

If the dilution system of ventilation is employed a minimum of 2000 cu. ft. of air per passenger per hour should be taken in. For 100 passengers this means 200,000 cu. ft. of air per hour per car. As each passenger has 14 cu. ft. of air space after subtraction is made for car seats and the bodies of the passengers, it follows that the air must be

changed 2.4 times per minute. This, of course, is impracticable. A volume of 200,000 cu. ft. of air per hour heated from 0 deg. Fahr. to 50 deg. Fahr. will require 181,181 B.t.u. per hour. Subtracting 19,700 B.t.u. furnished by the passengers leaves 161,481 B.t.u. per hour to be furnished by the resistance coils—an impossible amount of radiation in the room allowable in a street car. Therefore the dilution system is impractical. The cost would be 69.6 cents per hour per car if electricity costs 1.5 cents per kw-hour.

On page 272 of "The Electrification of Railway Terminals," 1908, we find the following table of electric heating costs. Some time ago the Chicago City Railway furnished the data on the cost of car heating by electricity given in the following table, which was originally published in the STREET RAILWAY JOURNAL:

Electric heating per car, 12 amp 9 hours equals 54 kw-hours at .992 cent.....	\$0.536
Interest at 5 per cent plus depreciation at 7 per cent on \$80, cost of heater, 365 days divided by 150 days' heating season.....	.064
Hauling dead weight 360 lb. 100 miles per day, 365 days per year, at .95 cent per day of heating season.....	.042
Repairs 5 cents per car per day.....	.050
Interest 5 per cent plus depreciation 3 per cent on additional copper required for electric heaters per day per heater.....	.038
Cost of electrical heating per day.....	\$0.73

ACTION OF ONTARIO RAILWAY & MUNICIPAL BOARD ON UNIFORM ACCOUNTS

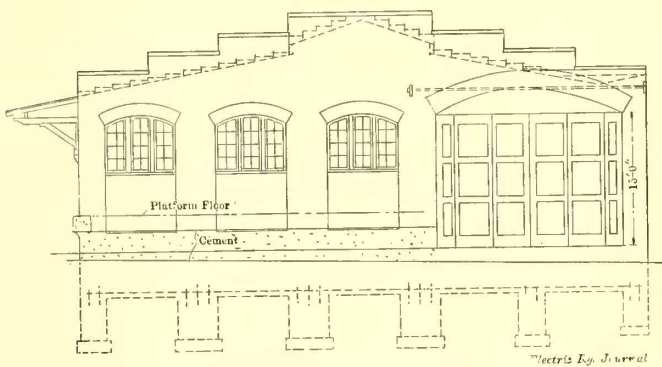
The third annual report of the Ontario Railway & Municipal Board, covering the year ended Dec. 31, 1908, states that the board concluded to "join in the movement to secure uniformity of returns both in the United States and Canada. As the forms of the returns which this board devised and sent out to be made by the railways under its jurisdiction are modern and in conformity with the best

the United States, and for statistical purposes uniformity of returns will be invaluable."

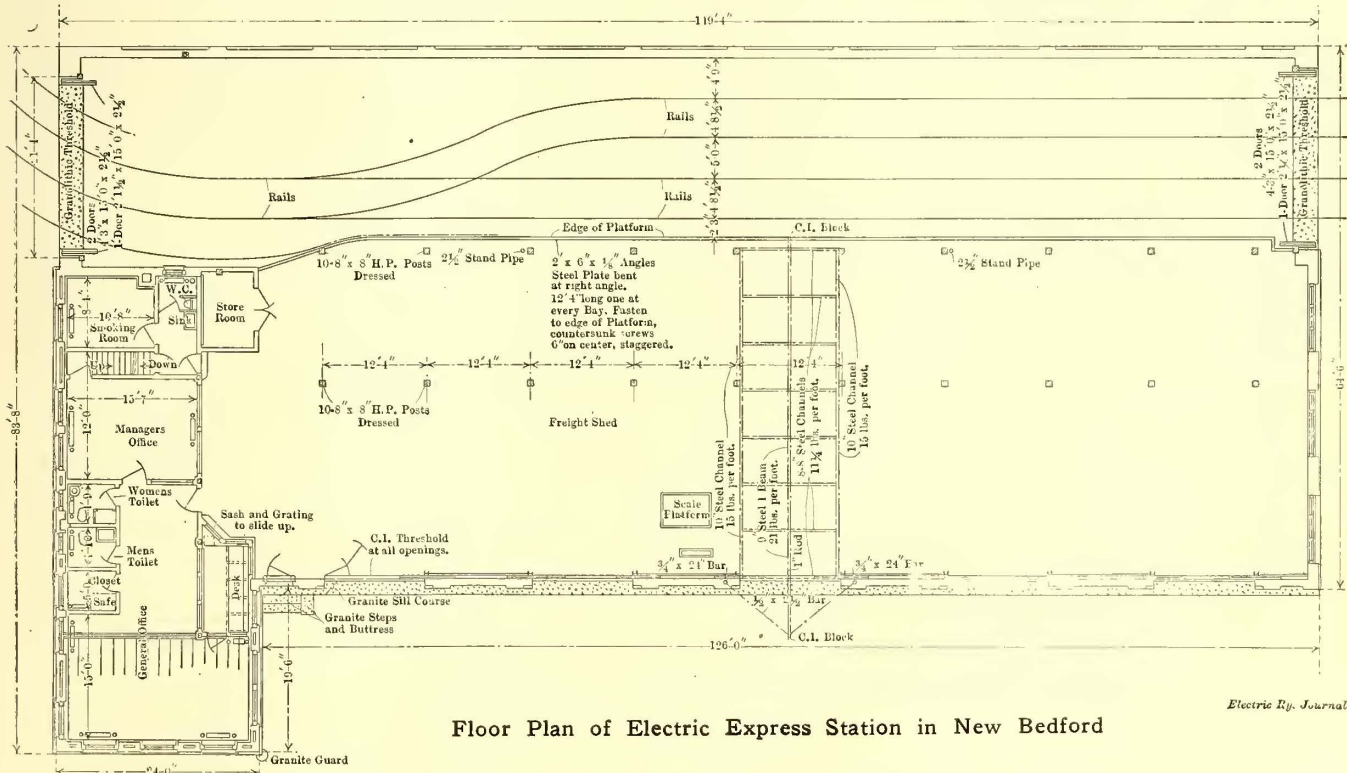
The report mentions the attendance of the board at the last convention of the American Street & Interurban Railway Engineering Association at Atlantic City, N. J. The board also attended the convention of the Canadian Street Railway Association at Ottawa, Ont., in November, 1908, "principally for the purpose of taking part in the discussion in reference to bringing about uniformity in the form of returns from railways in Canada."

ELECTRIC EXPRESS STATION AT NEW BEDFORD

The Dartmouth & Westport Street Railway Company is about to build a new freight terminal in New Bedford, Mass., to be located on the east side of North Water Street at the corner of Elm Street. The architect has succeeded in working out a building of neat appearance, and one which will prove very convenient for handling the large



End Elevation of Express Station



Floor Plan of Electric Express Station in New Bedford

up-to-date practices of company accounting, little or no change will require to be made in our forms. The advantage of uniformity of returns both in the United States and Canada is obvious. Comparisons of results of management and of operation and other details can be made between the different operating systems in Canada and

amount of freight that is shipped to and from New Bedford by the Dartmouth & Westport, New Bedford & Onset and Old Colony Street Railway companies.

As shown in the engravings, the cars will be under cover during the loading and unloading, and switches are arranged between the tracks for shunting purposes. Besides

the accommodations for freight, the building provides waiting rooms and general offices for the company. A feature of the building is a traveling crane which extends across the building from north to south, about midway between the east and west ends, for use in moving heavy machinery or freight of any kind that cannot be trucked easily across the floor of the shed. The station will cost \$20,000.

NOVEL LINE CAR ON INDIANAPOLIS, COLUMBUS & SOUTHERN

The Indianapolis, Columbus & Southern Traction Company has recently put in service a new form of line car. The car is 8 ft. 4 in. in width and 36 ft. long; 20 ft. of the length is closed cab, the remainder is the ordinary flat car design. The bottom framing is composed of four sills. The two side sills are of 6-in. x 10-in. pine, and the center sills are of 6-in. x 8-in. pine, running the full length of the car. There are four needle beams 6 in. x 8 in., with $1\frac{1}{4}$ -in. truss rods.

The closed cab portion of the car is fitted with shelving suitable for carrying all supplies necessary, such as trolley hangers, ears, insulators, frogs, crossings, etc., in fact, everything that is used in the construction of an overhead



Indianapolis, Columbus & Southern Line Car

trolley line. There are suitable hooks for hanging blocks and ropes, cabinets for tools, and a small work bench fitted with a vise. There is a platform extending the entire length of the roof of the cab, so as to prevent its wear by the workmen. The platform consists of 4-in. x $1\frac{1}{2}$ -in. oak, laid 1 in. apart. The side posts project through the roof to the height of the platform and carry the platform proper.

The car is provided with a tower, the normal position of which is level with the platform, of which it forms a part unless raised by means of a windlass and cable from the inside of the car. The tower can be raised to a height of 20 ft. and is also arranged to slide out over either side of the car a distance of 6 ft. The size of the tower is 4 ft. x 8 ft. 4 in., and the platform has a railing 1 ft. in height.

The rear or flat part of the car is arranged for holding reels of wire and for carrying poles. As the opening of the inner swinging doors of the cab is 5 ft. in width, long poles can be carried on the car by opening the doors and allowing the poles to extend into the interior of the cab. The space

between the sills at the rear end is ceiled at the bottom for the purpose of carrying shovels, bars, pike poles and such other tools as are used in the setting of poles. There is also a small platform that slides directly under the side of the bottom of the car and is held in place by iron straps. This platform is used as a bench in repairing telephone jack boxes, pole signs, etc.

The motor equipment consists of two GE-57 motors, both on the front truck, geared to 55 m.p.h., Brill No. 27 trucks and Christensen air brakes. The car is fitted with a full set of electric classification lamps.

The car was built at the company's shops at Greenwood, Ind., on design of and under the supervision of its master mechanic, T. W. Shelton. The accompanying description and illustration were supplied through the courtesy of A. A. Anderson, general manager of the company.

HEARINGS ON SIDE DOOR CARS IN NEW YORK

The hearing on side-door cars for the subway before the Public Service Commission of the First District of New York, set for Thursday, April 29, was postponed until Monday, May 3, at the request of Mr. Hedley, general manager of the Interborough Rapid Transit Company, who was obliged to attend an important engagement affecting his company. Mr. Hedley said, however, that the end-door train could be made ready for operation by May 10 if the commission desired. Mr. Eustis replied that from reports on the center-door train by the commission's experts, it would seem that the center-door train had made even a better record in service than the end-door train, and stated that the commission might be able to decide the type of train best suited for service from the data already in hand, without the necessity of putting the end-door train into service again.

At the hearing on May 3 Mr. Hedley said that he desired to submit evidence in rebuttal of Mr. Arnold's figures on the operation of the end-door train, but that the company would not be prepared to present its data for a week. Mr. Hedley has no doubts about the record made in service by the new center-door train. The train equipped with the center-door cars carries more people than the regular trains and reduces the time of stops at stations, but it increases the liability of accidents to passengers. Mr. Hedley also said he has concluded that any type of side-door car in the subway will increase the danger to passengers materially and add to the capacity of the road only slightly. The company is now preparing estimates of the increased carrying capacity of the side-door trains, but they are not sufficiently complete yet to venture an estimate. The train with side-door cars had been running eight days when the hearing was held, and there had already been several minor accidents and one serious one.

Mr. Hedley said that the company is operating about 430 cars on the express tracks, and that it expects to order a sufficient number of cars to utilize to a maximum all the improvements in the subway when they have been completed. It had taken only three weeks to change the new steel cars for center-door operation, but this was no criterion for converting the entire equipment, as the end-door train was stripped of its equipment to facilitate work on the side-door train, and less urgent work in the shops was abandoned temporarily to hasten the completion of the side-door train. Mr. Hedley said that it would take three or four months to secure material for changing the 50 steel cars bought recently, which are designed for con-

version to the side-door type. It would be a very slow and costly job to change the regular cars to cars of the end-door type.

The company will convert the 50 steel cars purchased recently if so ordered, but is opposed to converting more than 50 cars at this time. The 50 cars will give six trains of eight cars each. Mr. Hedley said that from the experience in service with these trains conclusions could be drawn regarding the advantages to be gained by converting all the cars intended for the express service. Mr. Hedley said that he himself may ultimately recommend the adoption of the side-door car to his company, but would not do so with the present experience as a basis for conclusions. On account of the additional weight of the side-door cars, the present side-door train is composed of six motor cars and two trailers.

NEW INLAND EMPIRE TRAIN SCHEDULE

The Inland Empire System, Spokane, Wash., announces a new summer schedule on its Cœur d'Alene division, beginning May 2. The new schedule includes 10 trains daily in each direction between Spokane, Wash., and Cœur d'Alene, Idaho. Five of these trains will carry one of the Inland's handsome parlor observation coaches. The Cœur d'Alene division of the Inland system runs east from Spokane to the city's beautiful lake resorts, and the new

picnic resort. The Inland Empire System has expended a large amount of money at this resort in building a handsome dancing pavilion over the lake and erecting new bath houses and a restaurant building; also a fine 35-acre park has been laid out at the company's terminal, bordering on the lake. This resort is a very popular one for picnic, bathing, boating and dancing parties.

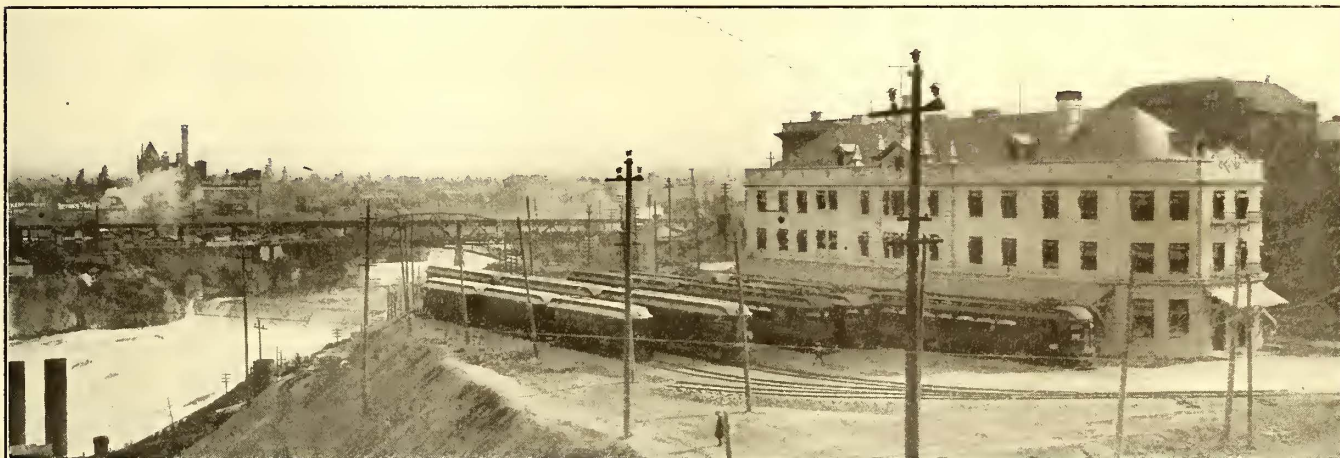
The accompanying illustration from a photograph shows a number of morning trains ready to leave the Spokane terminal station. The high fill along the river bank is being made by depositing the material excavated from the subway which is being built under Front Avenue to provide an entrance to the terminal station and relieve the present congestion on the surface tracks on the streets.

DEPRECIATION OF UNDERGROUND CONDUITS, CABLES AND WIRES

The annual report of the American Telephone & Telegraph Company for the year ended Dec. 31, 1908, contains the following discussion and figures on the subject of depreciation:

Studies have been made during the year to determine the actual rate of depreciation which should be provided for.

Figures from actual experience could be made for pole lines, iron wires and most of the central office and substation equipment, but underground conduits, copper wires, and cables must still be ascertained from experience.



Inland Empire Terminal Station at Spokane

schedule will include also seven trains in either direction between Spokane and Hayden Lake, Idaho, and also eight trains between Spokane and Liberty Lake, Wash., the city's chief bathing resort. Daily connections will be made at Cœur d'Alene, as heretofore, with the Red Collar Line steamers, which hoperate across Lake Cœur d'Alene and up the St. Joe River.

Besides the regular "Shoshone Flyer," which makes the run between Spokane and Cœur d'Alene, 32 miles, in one hour, connecting for the Cœur d'Alene mining district, the new schedule includes the "Camper's Limited," which will be a through train in either direction between Spokane and Hayden Lake, and will make the run of 40 miles in 1 hour and 16 minutes. This train leaves Spokane terminal daily, except Sunday, at 4:25 p. m. and reaches Hayden Lake at 5:40, thus enabling business men to live at the lake during the summer months. The train leaves Hayden Lake each morning at 7:40, arriving in Spokane at 8:50.

The eight trains in either direction between Spokane and Liberty Lake have been placed on the new schedule to give the very best service to Spokane's most popular bathing and

Of the total value of the telephone plants owned by the American Telephone & Telegraph Company and associated companies

	Per cent
Real estate constitutes	9
Underground conduits and cables.....	20
Copper wires and aerial cables on poles.....	18
Pole lines, not including wires.....	26

Eight million dollars of this represents ownership of rights of way over private property.

	Per cent
Iron wires	4
Central office and substation equipment.....	23

As to the depreciation of property, real estate is standard and established.

Underground conduits can be classed with real estate, or, rather, with permanent construction on long-term ground rents.

Cables and copper wires have shown very small depreciation, and experience has not yet established a definite rate; there is, however, a net scrap value of 40 per cent.

Iron wires have a life of from 8 to 15 years. Pole lines have a life of from 10 to 16 years.

Central office and substation equipment have a depreciation dependent on their character, the condition in which they are maintained, and on the policy of renewal or replacement by new or improved apparatus.

TICKETS ABANDONED IN PHILADELPHIA

On May 4, the Philadelphia Rapid Transit Company made the important announcement that it would abandon the sale of six tickets for 25 cents. The announcement was displayed in large advertisements printed in the Philadelphia daily papers, in which the reasons for the abandonment of the sale of these tickets were given. The step taken followed within a week a decision rendered by the Supreme Court of Pennsylvania, April 26, to the effect that the company was not obliged to give transfers except when a cash fare of 5 cents was paid. For the benefit of those who are not familiar with the fare situation in Philadelphia, a brief review will be given.

Prior to the organization of the Philadelphia Rapid Transit Company the street railway lines in Philadelphia were operated by several independent companies. The cash fare was five cents. Three cents additional was charged for an "exchange" ticket, which was good until used, except that at a few points several of the companies issued transfers without additional charge. About 1907, the company voluntarily placed on sale strips of six tickets which were sold for 25 cents, and gave free transfers with either ticket or cash fares. On June 20, 1907, a new franchise, readjusting the relations between the city and the company, was passed by the Council and was ratified by the company. This franchise contained a proviso "that the present rates of fare may be changed from time to time, but only with the consent of both parties hereto." A few months ago the Philadelphia Rapid Transit Company withdrew the transfer privilege when the fare was paid by ticket and allowed it only in cases when a cash fare was paid. The city immediately complained that this action was a change from the established rules of fare in existence when the contract was entered into, as it required a cash payment to secure the transfer. An injunction was asked restraining the company from discriminating in the way indicated. The case was decided in favor of the company in the court of Common Pleas, but was appealed by the city, and thus brought before the Supreme Court.

In its decision the Supreme Court defined the difference between rates of fare and charges for transportation in the following words:

OPINION OF SUPREME COURT

The question presented is a very narrow one. The expression "rates of fare" as used in the proviso is more or less inapt, and therefore lacks definiteness. We are not aided in its interpretation by anything elsewhere appearing in the contract. The proviso is left to speak for itself. Strictly speaking, the traction company had no established rates of fare when it entered into this contract. A rate is the measure of a thing by its ratio or relation to some fixed standard. When a certain sum is determined for a particular service, unless it is proportional and comparative according to a recognized standard, it is not a rate, but a charge. The compensation which this company was accustomed to receive for the facilities it afforded had relation to no standard. The 5-cent fare for one continuous ride was not measured by distance traveled or anything else that would suggest proportion, and the same must be said of every other fare it required. None of them was determined by ratio.

It is quite evident, however, that the reference in the proviso was to the charges and fares the company was receiving at the date of the contract; it could be to nothing else. Accepting this as the meaning, it is necessary first to inquire what these several charges were. We have referred to one—5 cents for a single continuous ride in the same car. Another was 8 cents for a single change from one car to another on certain intersecting lines. It is not defined that these charges fall within the meaning of the proviso. No attempt has been made to change these in any

particular. It is contended that there was also a third charge, distinguishable from these mentioned, which also falls within the proviso, viz., 25 cents for six tickets when purchased together, each ticket being the equivalent of a 5-cent cash fare and entitling the holder to equal service. * * * The sum of 25 cents distributed upon six tickets makes the cost of each, considered separately, $4\frac{1}{6}$ cents. This simple statement would seem to show such a reduction in cost to the purchaser as would warrant a conclusion that the company had two charges for the same service; that is, the continuous ride, one 5 cents and another $4\frac{1}{6}$ cents.

But this method of differentiating does not express the whole truth as we need to know it for a proper determination of the question. Clearly, the $4\frac{1}{6}$ -cent charge is not all the company exacts in the way of payment when it sells by ticket. One ticket cannot be purchased for that sum. In order to get one the purchaser must buy six and pay 25 cents before he gets any service whatever in return. It results that the company gets the benefit of this advance payment without interest. Where all the six tickets are used promptly the advantage derived by the company in this respect may be too slight to be considered; but, as every one knows, all are not used promptly, and it is not mere speculation to say that the general average would show a very substantial benefit inuring to the company, from this course, an advantage which could be fairly regarded as the full equivalent of the amount abated. Whatever the company gains in this way is at the cost of the party purchasing, of course.

The company was all the while adhering to the 5-cent charge for the general public. The ticket arrangement was one of its own devising, adopted not because forced upon it, but at its own pleasure. If the purpose was to reduce the charge, the question at once arises, to what end? It will hardly be contended that it was to gratify a generous impulse prompted by an over-abundant income. No more can it be supposed that it was done with a view to increase the company's revenues through an enlarged traffic. The average individual would not be likely to take more rides during a month or year because of the reduction of five-sixths of a cent upon each ride. It is quite as inconceivable that its purpose was to give individuals who, without inconvenience to themselves, could spare 25 cents at any time, the advantage of a lower fare than was charged those who could conveniently spare not more than 5 cents each time they travel. The only reasonable explanation is that in adopting the ticket system the object was to afford an additional convenience for a consideration in the way of advance payment, which would equal the amount of abatement in the fare in dollars and cents. Indeed, we think it so evident that the purpose of the company was to adhere to the 5-cent charge as a basis that we are unable to see how the complainant in contracting with the company with respect to the matter of fares could have any reason to suppose that the ticket system introduced any other.

It is only by supposing that the understanding of the parties with respect to it was wholly different from what the transaction on its face imparts as to its meaning and purpose that we can read this ticket system into the terms of the proviso, and there is nothing in the case as presented that would give us warrant for so doing. If, then, it is not "a rate of fare" within the meaning of the proviso, but a mere regulation of the convenience of the public involving no change in charge—and this is our conclusion—it follows that the traction company in restricting its application in the manner complained of was strictly within its rights, and the concurrence of the city was not required.

The decree is affirmed and the bill dismissed at the costs of appellant.

The announcement of the abandonment of the tickets follows:

ANNOUNCEMENT TO THE PUBLIC

Pursuant to a resolution this day unanimously adopted by the board of directors of the Philadelphia Rapid Transit Company, the sale of the six-for-a-quarter tickets will be discontinued on and after Tuesday, May 4, 1909.

During the past nine months the average fare received

by the company has been less than 4 cents, or about 3.90 cents. This sum is the result of the following distribution of all riders:

48 per cent pay the full fare of 5 cents.

8 per cent riding on exchange tickets, pay 4 cents.

31 per cent riding on package tickets, pay 4 1/6 cents.

13 per cent ride on free transfers.

It is absolutely necessary that the company increase its revenues for four reasons:

1. With this average per passenger it is doubtful if the company during the current fiscal year could, with the strictest economy, meet its operating expenses and fixed charges. The tendency of everything in this country is to cost more, and there seems no chance that the roads can be operated any more cheaply in the future than they are now being operated.

2. An economical operation of any public service corporation means inferior service to the public. The company must be more liberal in its expenditures if the public is to have better accommodations.

3. The directors of a corporation owe a duty to their own stockholders. They are the trustees for the \$30,000,000 of capital which has been paid into this company during the past seven years and expended in order to give the people better transportation facilities. Not one dollar of return has been received by these stockholders, and at present market rates their capital has depreciated upward of 25 per cent. The lost interest on this fund to our stockholders will amount on July 1, 1909, to \$6,239,725.

4. Every public service corporation must grow with the city which it serves. In fact, it must grow first or the city cannot grow. Extensions, additional cars, more power, all cost money. A company which has no credit can get no new money either on stock or bonds; and if money is to be spent in the future the credit of the Philadelphia Rapid Transit Company must be assured. This can only be done by increased earnings.

Under the contract with the city, it is provided that the stockholders of the company shall first receive in dividends before any distribution is made to the city 6 per cent on the moneys paid in by them, dating from Jan. 1, 1907. Already there is accumulated under this provision of the contract over \$6 per share on the 600,000 shares of the company, and this amount is due to the stockholders of the company before the city can receive any division of the profits. This gross amount to which the stockholders are entitled under the contract is \$3,827,225. As an evidence of the good faith of this company, and as a proof that its purposes are not merely to enrich its stockholders, if the people, through their representatives in Councils, will pass an ordinance authorizing the changes in the contract outlined herein, we will recommend to our stockholders that they shall agree to such changes. These changes shall include a surrender by the stockholders of all accumulated dividends on their stock to which they are at present entitled up to July 1 of the current year.

As already stated, this amounts approximately to \$4,000,000, and represents any increase in fares which will be received by the company for at least the next two years. We will also recommend that hereafter the dividends shall not be cumulative, but shall be paid and divided under the contract only from year to year as earned. This will prevent any accumulation against the city's share during the periods of business depression in the future.

The Rapid Transit Company is under no compulsion in this matter. It does not need any action by Councils. It does, however, appreciate the value of the good will of the people.

The Rapid Transit Company appreciates that the contract with the city would never have received the unanimous support of the press of the city and the approval of its most prominent and public-spirited citizens if all parties had not believed that the city would reap in the immediate future substantial returns. You looked for an immediate payment into the city treasury; you looked for immediate extensions, and perhaps the last thing which you expected was any change in the schedule of charges which would result in an increase of the rate per passenger. An increase in revenue is imperative if the community is to reap the benefits of the contract. As already stated, the

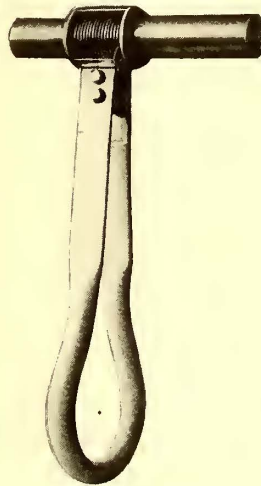
present average charge per passenger is 3.90. A careful estimate of the average charge under the new schedule is 4.35, a change of less than 1/2 cent per passenger. If the company continued strip tickets and abolished all free transfers, the average charge would be greater, viz., about 4.42. This would be unfair to the poorer people who have bought their small homes in the outlying districts, where property is cheaper and fresh air plentiful. A cutting off of transfers would stop the growth of the city and tend toward a congested population.

It has been said that the abolition of the sale of tickets will mean an addition to the cost of transportation for those least able to pay. This is a mistake. The result of observations carefully made by the company, and the knowledge of the people themselves, justify the assertion that the majority of those who use package tickets use them on account of the convenience. They are bought to save trouble more than to save money.

So, it has been asserted, that the stock of the Philadelphia Rapid Transit Company has been watered and that the action now taken by the company has for its object the solely selfish purpose of paying dividends upon fictitious stock. The fact is that the thirty millions of capital stock of this company represents no water or fiction of any kind whatever, but every dollar of it has been paid by the stockholders and has gone into the construction, operation and maintenance of the street railway properties.

SANITARY HANGERS IN NEW YORK SUBWAY CARS

The Interborough Rapid Transit Company, of New York, has been trying for the past week a car equipped with novel non-leather hangers in place of the customary hand straps, in line with its policy to make its cars as sanitary as possible. The new hanger is made of No. 26 steel



Sanitary Hanger

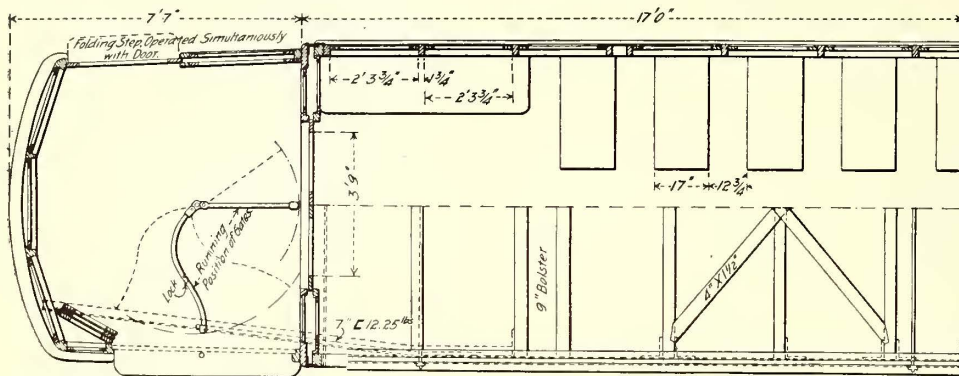
tubing covered with a porcelain enamel which is glazed on at 1800 deg. F. The most valuable feature of this hanger is its absolute cleanliness, as the porcelain coating prevents the absorption of dirt or perspiration. This quality has met with favorable comment from the press and the public. The ladies in particular are pleased, because they no longer suffer the discomfort of having their silk or kid gloves soiled by smutty straps. The shape of the hanger is also much more convenient and restful for the hand than flat, thin-edged leather straps.

The company does not rely upon the smooth, non-absorbent surface of the hangers to keep them germ-proof. Every night the handles are immersed in an earthen vessel containing a solution of carbolic acid—a treatment which could not be withstood by straps of animal or vegetable fiber. The hangers do not have to be removed from the tubing, as the vessel is simply lifted up beneath them. After the hangers have been dipped, they are left to dry without any further attention.

On examining the accompanying illustration it will be noted that the upper part of the hanger has a spring to keep it in tension at an angle to the hanger tube. When the hanger is not kept perpendicular by the passenger the tension of the spring is sufficient to prevent it from swaying and interfering with people in any way. It is possible to use a glazed handle without the spring by employing leather connections which can be looped around the tube to keep the hanger perpendicular at all times.

**NEW CITY CARS FOR CHICAGO & MILWAUKEE
ELECTRIC RAILROAD**

The Chicago & Milwaukee Electric Railroad operates a local street car service over its 3.5-mile double-track entrance to the city of Milwaukee. During the past season small interurban cars have been used in this local service, but it now is announced by L. L. Smith, master mechanic, that 10 new cars for city service in Milwaukee will be built for the company by the St. Louis Car Company. The accompanying half floor plan shows the platform arrange-



Floor Plan of "Pay-On-Platform" City Car for Chicago & Milwaukee Electric Railroad

ment as designed for the use of the Birney "pay-on-platform" method of fare collection.

The car body length over corner posts is to be 34 ft.; length over bumpers, 49 ft. 2 in.; width over vestibules, 7 ft. 3 in., and width over all, 8 ft. 8 in. While the car is primarily designed for city service, it is suitable also for suburban or summer park service. Every effort has been made to eliminate unnecessary weight without sacrificing a rugged, durable construction. The underframing is of steel, employing the Robertson double channel construction, giving a continuous rectangular steel frame under the body proper, with 8-in., 11.25-lb. channels placed back to back and a 6-in. x 1/2-in. plate riveted to the bottom flanges, forming a box girder. The posts and superstructure are of wood, except that 13 steel carlines are used in the roof. The outside panels below the window rail are sheathed with No. 16 gage steel plates.

Four GE-216 interpole type motors, rated at 50 hp at 600 volts, are to be used. A K-28 F. controller will be mounted on each platform.

The trucks are of the McGuire-Cummings No. 20-A design, with a wheel base of 6 ft. The truck frames are made of 4-in. x 3 1/2-in. x 5/8-in. angles braced with center and corner gusset sheets. The axles of open-hearth steel with journals 4 1/4 in. x 8 in.; the wheels are rolled steel 34 in. in diameter. Brakes and motors are inside hung.

The interior trim will be of birch with mahogany finish and birdseye maple headlining. There will be 18 double cross seats and four longitudinal seats in the corners, giving a total seating capacity of 52. The cross seats are of the Hale & Kilburn "Walkover" type with pressed-steel pedestals and end plates and rattan covering.

Other special equipment includes the following: Westinghouse straight-air brakes, American Brake Shoe & Foundry Company brake shoes, Van Dorn No. 11 couplers, Forsyth ring curtain fixtures, General Electric gears and pinions, 14-in. steel gongs, St. Louis vertical brake wheels, Consolidated electric heaters, Incandescent headlights, Sherwin-Williams paint, Ham air sanders, Stanwood steps, General Electric trolley pole fixtures, Murphy varnish.

PENNSYLVANIA ELECTRIC LOCOMOTIVES

A dispatch from Pittsburg states that the East Pittsburg shops of the Westinghouse Electric & Manufacturing Company have received orders to begin the construction of the first lot of electric locomotives which the Pennsylvania Railroad Company will operate in the tunnels of the New York terminals. It is understood that these locomotives will combine the most desirable features of electric locomotive design as determined by the tests conducted by the company with locomotives of different types on the West

Jersey & Seashore and the Long Island railroads, and by the manufacturers at East Pittsburg. These tests have represented the expenditure of more than \$500,000.

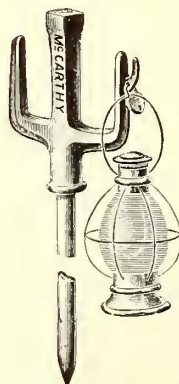
It is understood that the locomotives will be the most powerful electric locomotives ever built, and will be of the articulated type, each locomotive to consist of two units. Each unit will be equipped with one 2000-hp direct-current motor mounted above the frames and con-

ected to the wheels by connecting rods and side rods. The locomotives will be able to attain a speed of 90 m.p.h., and the first two to be built will be ready for test in the early fall. The present order will consist of 24 double units, but it is probable that more will be required soon after the terminal station is opened.

A GUARD RAIL AND LANTERN HOLDER

The Metal Finishing Company, Union City, Conn., has added to its extensive line of electrical hardware of pins, brackets, switches, trolley ears, wood strain insulators, etc., the McCarthy guard rail and lantern holder shown in the accompanying cut. This device consists of a bar 4 ft. 2 in. long, constructed of malleable and wrought iron. The upper part is trident-shaped and has three heavy prongs 2 1/2 in. apart, thus giving ample room for the insertion of planks. The type shown is especially designed for ordinary dirt or macadam roads, or any pavements of the Belgian block type which permit the incision of a pointed bar without damage. In this particular type the lower end of the trident is pointed, so that the guard-rail holder may be driven into the earth any desirable distance.

This continuance is also manufactured with a heavy instead of a pointed base, for use on smooth pavements, such as asphalt and vitrified brick. The manufacturer states that this saves considerable time and expense, since it obviates the necessity of piling up stones on which to put planks for protection, and also makes it unnecessary to carry barrels around from one place to another. The holder has a receptacle on one side for the lantern. Each holder is furnished with a Corbin lock, to permit the lantern to be locked and thereby eliminate all possibility of its being stolen. At the same time, the lantern will burn without interruption.



Guard Rail and Lantern Holder

News of Electric Railways

Cleveland Traction Situation

At the meeting of the committee of the whole of the City Council of Cleveland on April 26 Judge Tayler stated that he did not feel that it would be expedient for him to express his ideas at this time, but that he did think that he should sound a note of warning, since it seemed to him that a settlement would never be reached if the intention of some of the members of the Council is carried out and the question of valuation opened. Judge Tayler feels that the discussions should be upon the vital points at issue rather than on the matters which have taken up so much time of late.

Horace E. Andrews, president of the Cleveland Railway, stated that the company would need \$13,842,000 within the next four years to care for the bonded debt and improvements if a settlement should be reached under the Tayler plan. Of this amount Mr. Andrews estimates that \$1,000,000 would be needed for improvements. He read telegrams from Speyer & Company and from N. W. Harris & Company, New York, in which they stated that bonds of the company could not be handled if the maximum rate was made seven tickets for 25 cents. Mr. Andrews even said that he doubted whether the bonds could be sold if a maximum rate of six tickets for 25 cents was adopted. He also read letters from Hayden, Miller & Company; J. R. Nutt, of the Citizens' Savings & Trust Company; E. G. Tillotson, E. W. Moore and others. All hold about the same opinion. When the offer of the company two years ago to accept a franchise at seven tickets for 25 cents was called to Mr. Andrews' attention he said that he expected no dividend for four or five years after starting at that rate. Mr. Andrews said that personally he would be willing to accept a franchise providing for the sale of seven tickets for 25 cents if the other provisions of the franchise were sufficiently liberal.

At a meeting of the retail merchants' board of the Chamber of Commerce on April 26 the matter of securing better terminals for the interurban railways was discussed. E. W. Moore, president of the Lake Shore Electric Railway, said that it would be difficult to perfect arrangements for the interurban railways until the situation in Cleveland is adjusted, but that the interurban roads are willing to do anything they can for the business interests of the city. Receivers Bicknell and Scott said that they could do nothing looking to the relief of the interurban situation, as the creditors must approve all expenditures.

Prof. E. W. Bemis, superintendent of the water works department, who has been revising the appraisal values of the railway property, estimates that the value is \$7,130,797 less than the appraisers reported a year ago when the Municipal Traction Company took over the Cleveland Electric Railway. Apparently Mayor Johnson, City Solicitor Baker and a number of members of Council are convinced by the findings of Mr. Bemis that there should be a revision of the figures, although at the meeting on April 28 they did not contend that his results were correct or that they should be taken as final. A summary of the report by Professor Bemis follows:

Deductions on track.....	\$990,887
Deductions on pavement.....	1,498,000
Total gross deduction on track and pavement.....	\$2,488,887
Addition to overhead.....	474,090
Net deduction on physical value.....	\$2,014,797
Deduction on franchise value.....	2,416,000
Deduction on good-will.....	2,700,000
Total deductions.....	\$7,130,797
Total appraisal.....	22,184,132
Appraisal, less above deductions.....	15,053,335
Outstanding liabilities Jan. 1, 1908.....	9,314,132
Net value left in stock.....	5,739,203
Total value per share.....	24.53
Total reductions on value per share.....	31.47

"So far as the Cleveland Railway or the receivers have secured from the car riders an amount in excess of the interest at 6 per cent on the approximately \$2,000,000 property of the Forest City and the Neutral Traction Company since last spring and 6 per cent on the \$13,000,000 of the physical value, and on the approximately \$2,000,000 of franchise value—in other words, just so far as the company or the receivers have secured more than 6 per cent on \$17,000,000 to that extent will there be reductions from the franchise value due to the Cleveland Electric Railway. In other words, through a part of the dividend rentals already paid, and through the money accumulated from the excess of the 5-cent fare above, about 3.25 cents since Feb. 1, to that extent have the public been paying off some of the

\$2,000,000 of the principal of the franchise value already mentioned."

These figures are all on the property originally owned by the Cleveland Electric Railway. The report on the property acquired from the Forest City Railway, Mr. Bemis said, was made up from the books of the company, and not from an investigation into the merits of the case. The valuation of the Forest City Railway is left at \$1,805,600, just as it was a year ago, when the Cleveland Railway purchased the property. Professor Bemis has deducted the amount allowed the old company for good-will in the leasing contract and has made a large reduction in the franchise value, although the Cleveland Railway has received no benefit from the property during the past year with the exception of one dividend of \$220,000 paid during the first quarter of the Municipal Traction Company's régime. After making total deductions of \$7,130,797, Professor Bemis states that the net value of the property is \$5,739,203, this being the amount after taking out the outstanding liabilities on Jan. 1, 1908. The value of the stock is placed at \$24.53 per share, which is a reduction of \$31.47 from the \$55 which Mayor Johnson and Mr. Goff decided upon a year ago.

Valuations of franchises were predicated in some cases upon the possibility of competing low-fare lines paralleling the company's lines in case a settlement is not reached. Figures for comparison were taken from the present low-fare lines, whose cars are uncomfortably crowded most of the time. Other results were reached by similar computations, and it is not believed that the bases taken would be anything like that required in a satisfactory operation of the lines.

Horace E. Andrews, president of the Cleveland Railway, stated that he had entered into the negotiations with the distinct understanding that the valuation found a year ago would be used as a basis of settlement at this time. If a new appraisal must be had he wants the work done by a board of arbitration composed of men not intimately acquainted with the situation in Cleveland. He suggested that one member of the board be chosen by the company, another by the city and a third by the city and the company or by Judge Tayler, if a third is needed. According to Mr. Andrews, his company would be willing to abide by the decision of such a board.

The Mayor insists that both sides shall decide upon the points they wish to arbitrate before the matter is given to a board. Mr. Andrews favors naming the points on which both agree and then having the board take up all others. It was decided that the valuations placed on real estate, power houses and some other items are satisfactory to both. These matters would merely be added to the results on the disputed points. It was suggested that the rules used by Mayor Johnson and Mr. Goff be accepted by the new board, but this suggestion was not adopted.

Mr. Andrews stated that if the value of the property is to be arbitrated he wants the conclusions to be as of Jan. 1, 1908, with 6 per cent interest on the valuation from that time, as the company has had no benefits from the property from that date. The Mayor suggested that the subject of revaluing the property be considered by both sides until May 3, and the matter went over until that date.

Discussion of Transit Problems in New York

At the annual transportation night dinner of the Municipal Club of New York, at the Imperial, in Brooklyn, on Tuesday, April 27, some interesting statements were made regarding the rapid transit situation in New York by Commissioner Eustis, of the Public Service Commission of the First District, and E. W. Winter, president of the Brooklyn Rapid Transit Company. T. P. Shonts, president of the Interborough Rapid Transit Company, was unable to attend on account of a business engagement. Mr. Eustis' remarks concerned chiefly the possibilities for transit development contained in the Travis-Robinson bill which has passed the Legislature and is to be submitted to the people of New York State for approval. It exempts from the debt limit of the city income-earning bonds and will make available for rapid transit construction in New York about \$150,000,000. The commissioner criticized the attitude of several city officials on rapid transit measures as picayune and said that they seemingly did not exercise the same caution in acting on other measures affecting the city and involving the expenditure of considerable sums of money for public works.

It has been known for some time that the Brooklyn Rapid Transit Company had tentative plans in mind for the

reconstruction of its elevated lines and the building on certain of them of additional tracks for handling passengers during the rush hours. President Winter, of the company, however, made the statement that he had recently submitted to the directors of the Brooklyn Rapid Transit Company a plan calling for the expenditure of about \$37,000,000 in connection with elevated railway and other improvements. He said that in his opinion the only adequate transit development for Brooklyn was to be found in a comprehensive extension of the elevated system. His opinion is that it would be useless to extend the terminal facilities of the company in Manhattan unless additions are made to the elevated system in Brooklyn so that proper use can be made of the terminal extensions in Manhattan. He said that the improvements which he has proposed to the directors involve the four-tracking of the Fulton Street line, the four-tracking of the Broadway line and the laying of at least a third track on the Fifth Avenue line. Mr. Winter has grave doubts about the ability of the proposed Fourth Avenue subway in Brooklyn to pay, and said he thought that sight had been lost of the fact that the movement of traffic in Brooklyn is largely one way, that is, Manhattanward in the morning rush hours and Brooklynward in the evening rush hours. According to Mr. Winter the fact is not generally appreciated that the transportation business in New York is on a new basis, both as to means of creating facilities and methods of operation; that these new conditions, while there is much to be said in their favor, are turning the current of the industry into new and untried channels, and that calculations of the future which do not take into intelligent consideration this potent and far-reaching influence will surely go astray.

Mr. Winter also discussed the question of street railway fares. He said that at the time of the agitation of a 5-cent fare to Coney Island it would have been impossible to receive fair consideration at the hands of the public, whose minds had been inflamed by agitators unacquainted with street railway conditions and not qualified to discuss the cost of passenger transportation and that it would have availed the company nothing to have set up at that time its estimate of the cost of transporting passengers. Taking the returns of the Brooklyn Rapid Transit system for 1908 and reducing the tariff to a passenger fare basis of 5 cents, Mr. Winter said that 20 per cent of every fare, or 1 cent, was returned to the public in transfers; that operation, maintenance and paving absorbed 2.35 cents; taxes, 0.22 cent, and interest and rental 1.1 cents, leaving to the company 0.33 cent per passenger. President Winter concluded by saying:

"On the difference between transportation and other industrial products are based many misconceptions. It would be much easier than it is for the average passenger to realize the commercial aspect of the transaction if he could know the actual cost to the manufacturer of the particular quantity of transportation he is purchasing with his nickel—or receives for nothing on a transfer. True, it might irritate him to find 2½ cents marked on the package he has bought at double the sum, but this would be counterbalanced by the next passenger, who would note the gratifying fact that he was getting double or triple the quantity of goods the carrier could turn out for the price paid. Whichever way it might go, the fact that to produce the particular piece of transportation he was receiving had cost a specific sum would be realized and the way opened to recognition of the succeeding proposition that a transportation merchant must receive an average of more than cost for his goods, or he can't stay in business.

"Assuming that he is rightfully in and lawfully conducting his business, he has the right to a reasonable profit; and yet, nearly every day we see or hear of movements on the part of the unconscious public possibly involving serious consequences with no apparent consideration of what their effect may be on the interests immediately concerned, and ultimately, through them, on the public itself. Now, it would be unjust to charge this familiar experience to evil intent or more than the average selfishness of aggressive business methods on the part of the public. The real explanation lies in the lack of appreciation of the fact that this exaction, while bringing advantage to the one, inflicts a tangible loss on the other, and that before compelling this loss in the interests of common equity and the common good, the offside merits of the proposition should be fairly weighed, though they rarely receive any consideration."

Plans of Southwestern Ohio Traction Company

It is understood now that the plans of John E. Bleekman, president of the Southwestern Ohio Traction Company, the incorporation of which was noted on page 802 of the issue of the ELECTRIC RAILWAY JOURNAL of April 24,

1909, include the construction of an elevated and underground railway in Cincinnati which will afford a ready entrance to the heart of the city for the interurban roads and the consolidation and extension of several of the roads. Mr. Bleekman has filed an ordinance with the city clerk which provides that the proposed road shall extend from downtown Cincinnati along either Third Street or Pearl Street to Norwood and from a connection with this line to the east end of the city, furnishing an entrance for the cars of the Cincinnati, Milford & Loveland Railway, the Interurban Railway & Terminal Company, the Cincinnati & Columbus Traction Company and the Cincinnati, Georgetown & Portsmouth Railroad.

The capital stock of the Southwestern Ohio Traction Company will be increased from \$10,000 to \$13,000,000, of which \$3,000,000 will be preferred stock and \$10,000,000 common stock. It is also proposed to issue \$12,000,000 of bonds. George H. Worthington, Cleveland, will be elected chairman of the board of directors of the company; the other members of the board will be: Charles H. Davis, J. M. Hutton, Lewis Seasongood, Henry H. Huffman and B. H. Karger or a representative of the Karger lines, W. L. Moyer, A. S. White, Samuel Jarvis, J. L. Greetsinger and representatives of several trust companies.

Following the proposal made two years ago to construct such a road as is now contemplated Mr. Bleekman and others decided to investigate the situation and report on the engineering possibilities. Charles Hansel, of Charles Hansel & Company, New York, and J. M. Stewart, Cincinnati, did the engineering work in Cincinnati, and Jenkin W. Jones, Columbus, Ohio, inquired into the extensions toward Columbus. The estimated cost of the work in Cincinnati is \$5,000,000, while the proposed acquisitions and extensions will entail an expenditure of \$12,000,000 more. The tunnel under Walnut Hills in Cincinnati will be about 4400 ft. long. The proposed extensions to interurban lines will furnish direct connection with Columbus, 103 miles; Springfield, 70 miles; Blanchester, 35 miles; Hillsboro, 50 miles; Bethel, 32 miles; New Richmond, 21 miles, and a number of other towns. The principal new line will be an extension of the Cincinnati, Milford & Loveland Traction Company's present road to Columbus from either Hillsboro or Blanchester. It is said that the Cincinnati, Milford & Loveland Traction Company operating to Blanchester; the Interurban Railway & Terminal Company, operating to Lebanon, Bethel and Georgetown, and the Cincinnati & Columbus Traction Company will all be included in the merger. The consummation of the project as outlined now depends upon the action of the City Council on the franchise requested.

Joint Data Sheet on Shop Accounts

The joint committee of the American Street & Interurban Railway Accountants' Association and of the American Street & Interurban Railway Engineering Association, appointed to consider the question of shop accounting, has issued a letter asking for copies of shop schedules and other data. This committee consists of: C. L. S. Tingley, vice-president, American Railways Company, Philadelphia; F. B. Lasher, accountant, Mohawk Valley Company, New York; P. S. Young, comptroller, Public Service Railway Company, Newark; Wm. G. Gove, superintendent of equipment, Brooklyn Rapid Transit Company, Brooklyn; Charles Hewitt, superintendent motive power, Philadelphia, and John Lindall, superintendent rolling stock and shops, Boston Elevated Railway Company, Boston.

The letter, which is signed by W. G. Gove, chairman of the committee, reads as follows:

"To the general managers of member and non-member companies.

"The joint committee of the Accountants' and Engineering associations, appointed to consider the question of departmental accounts, is desirous of obtaining eight copies of the schedule of operating expenses as used by your company, this schedule to show particularly all subdivisions of main accounts covering the maintenance of equipment, both power house and rolling stock; the maintenance of way and structures, and of overhead lines and cables. The committee proposes to submit, for the consideration of the two associations, a report on a uniform system of subdividing accounts, and in this way endeavor to standardize and co-ordinate methods of making charges to the underlying accounts of the standard classification of the American Street & Interurban Railway Accountants' Association.

"The committee earnestly requests your hearty co-operation in this matter, as it will require a comprehensive exhibit of the various schedules in use throughout the country to enable it to arrive at conclusions which will meet with the approval of electric railway companies as a whole.

Prompt response is also requested in order that the committee may have ample time in which to formulate its report for presentation to the 1909 convention.

"Please mail all schedules, with the name of your company marked thereon, to Bernard V. Swenson, secretary, American Street & Interurban Railway Association, 29 West Thirty-ninth Street, New York."

W. M. G. GOVE, Chairman.

H. L. Weber in New Ohio Line

J. G. Webb and associates, mainly Cincinnati and Louisville capitalists, have employed H. L. Weber as chief engineer to push surveys and construction of the new connecting link between Columbus and Toledo, Ohio, via Marion and Findlay. The Webb interests control the line from Findlay to Toledo, and it is the ultimate aim to connect with their lines in the southern part of the State and have a through line from the Ohio River to the Lakes.

Considerable interest is attached to the location of the new extension as the city of Bucyrus is making an effort to have the new line run from Marion to Findlay via Bucyrus, where the Webb syndicate already has a line entering the city from the north. This would make the city a diverging point for lines from Columbus to Toledo and Cleveland and would be an important factor in making Bucyrus a coming interurban city.

Mr. Weber is still directing the affairs of the Utah & Southwestern Railroad as chief engineer and has left C. L. Rood as the resident engineer in charge of the local office at Los Angeles, Cal. Mr. Rood will have charge of field operations in Utah when construction work is commenced. Mr. Weber was formerly chief engineer of the Fort Wayne & Wabash Valley Traction Company and had charge of the recent reconstruction and extension work on those lines. Mr. Rood was associated with Mr. Weber in this work as resident engineer on the Logansport and Lafayette extension.

Second Hudson Tunnel to Be in Operation in July.—The Hudson & Manhattan Railroad has formally announced to the public that it expects to place its tunnel under the Hudson River between the Pennsylvania Railroad station in Jersey City and its own terminal building at Church and Cortlandt Streets, New York, in operation about July 1.

Oklahoma Electric Light, Railway & Gas Association.—F. H. Tidnam, president of the Oklahoma Electric Light, Railway & Gas Association, announces that the third annual convention of the association will be held in Oklahoma City on May 18, 19 and 20. The officers of the association promise an excellent program. Galen Crow, Guthrie, Okla., is secretary of the association.

Meeting of Colorado Association.—The Colorado Light, Power & Railway Association will probably hold its annual convention in Denver during the week of Oct. 11-16. As this is the week preceding the annual convention in Denver of the American Street & Interurban Railway Association, the members of the Colorado association will arrange to stay in Denver for both meetings.

Agreement Between Mahoning & Shenango Valley Railway and Employees.—The Mahoning & Shenango Valley Railway, Youngstown, Ohio, and its employees have reached an agreement regarding wages for the ensuing year which provides that the pay shall be 22, 23 or 24 cents an hour, according to the number of years the men have been in the employ of the company.

Meeting of Committee on Power Generation.—G. H. Kelsey, chairman of the American Street & Interurban Railway Engineering Association's committee on power generation, has called a meeting of the committee to be held on May 11, in Pittsburg, Pa. The committee will organize and outline plans for the preparation of its report to be presented at the Denver convention of the association in October.

Annual Convention of the Street Railway Association of the State of New York.—The 27th annual convention of the Street Railway Association of the State of New York will be held at the Fort William Henry Hotel, Lake George, on Tuesday and Wednesday, June 29 and 30, 1909. Hotel accommodations and reservations can be secured through J. F. Wilson, manager of the Fort William Henry Hotel, 243 Fifth Avenue, New York. The program of the meeting has not yet been announced.

International Conference of Railroad Y. M. C. A.—The thirteenth international conference of the Railroad Young Men's Christian Association will be held in St. Louis on May 27, 28, 29 and 30. From 1200 to 1500 railroad men from all parts of the United States, Canada and Mexico will attend, representing 240 railroad branches of the association. Presidents and other officials of railroad compa-

nies will meet employees from all branches of railway service, and will listen to addresses and participate in discussions bearing upon the work of the association with the representatives of the railroads.

Massachusetts Railroad Commission Issues Finding on Malden Elevated Extension.—The Massachusetts Railroad Commission has issued an order stating that it will approve the extension of the Boston Elevated Railway to Malden by a general route from the Sullivan Square terminal through Alford Street to Chemical Lane, and thence over private lands and parallel to the Saugus branch of the Boston & Maine Railroad to a terminus near Main Street in the square in Malden bounded by Main, Charles, Middlesex and Centre Streets. The commission states that the route will relieve the streets of elevated structures placed longitudinally in them.

Commodities Clause Valid.—The Supreme Court of the United States on May 3 in the cases of the anthracite coal roads held that the so-called commodities clause of the Hepburn rate act is constitutional. This reverses the finding of the Federal Circuit Court for the Eastern District of Pennsylvania. The Supreme Court holds, however, that the ownership by railroads of stock in coal companies is not direct or indirect interest in the commodity within the meaning of the act, which will permit the roads to continue their coal business through other corporations, and also that the act does not prevent a railroad from owning coal mines and operating them; providing it sells the coal at the pit mouth in good faith, the road can also transport its products.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Massachusetts.—Governor Draper has signed the bill to permit the General Electric Company to use a part of the tracks of the Pittsfield Street Railway and has also affixed his signature to the bill authorizing the Railroad Commission to recommend relocations of railroad and street railway stations. The law now provides that if the board is of the opinion that repairs are necessary upon any railroad or street railway, or that an addition to its rolling stock, change or relocation of stations, change in waiting-rooms or rates of fare or freight charges, it shall recommend them. The bill to authorize the Connecticut Valley Street Railway to fund its floating debt has progressed to the point of a third reading in the Senate, after having passed the House to be engrossed. The Senate bill relative to the locations of street railway companies has been passed to be engrossed in the Senate and given a first reading in the House. This bill modifies the requirements as to the voting of boards of directors on location matters and allows a little more elasticity in the action of such boards than the old law permitted, and it extends the time limit of accepting locations from 30 days to 60 days. The report of the committee on metropolitan affairs giving leave to withdraw on the Bryant bill to locate the Boston terminus of the Cambridge subway at Scollay Square has been accepted by the Senate. The House has given a first reading to the resolve to provide for an investigation and report by the Boston Transit Commission and the Railroad Commission in regard to the consolidation of the Boston Elevated Railway and the West End Street Railway.

New York.—The Legislature adjourned on April 30. There is considerable talk of an extra session, but no one will venture to express an authoritative opinion. There is the precedent before the body of the extra session last year, but it is pointed out that measures endorsed by the Governor have received more courteous consideration at this session than ever before, despite the fact that several acts which he urged were not passed. In his annual message to the Legislature the Governor made recommendations upon 29 subjects, and in reviewing the work of the session it is found that 22 of the subjects he recommended were passed. The most important transit matters recommended by the Governor and approved provide for the construction of additional rapid transit lines in New York by the city or by private capital and for submitting to the voters a constitutional amendment, making \$150,000,000 available for subway construction in New York by exempting income-producing bonds from the city's debt limit. The recommendation of the Governor that the authority of the Public Service Commissions be increased and extended to include telephone and telegraph companies was not approved, but provision has been made for the appointment of a legislative commission to investigate thoroughly the operations of the existing law and to determine if the present work of the commission would warrant an extension of the jurisdiction of the commissions. The New York Central & Hudson River Railroad has been given the right, with the approval of the Public Service Commission and the Board of Estimate and Apportionment, to construct a combined subway and elevated line on Eleventh Avenue, New York, to take the place of its surface tracks.

Financial and Corporate

New York Stock and Money Market

May 4, 1909.

After several days of moderate trading and irregular prices, the stock market wakened yesterday and to-day to activity with a strong upward tendency. This sudden change for the better was attributable directly to the United States Supreme Court decision in the commodities case. Rates for money to-day were: Call, 1³/₄ to 2¹/₄ per cent; 90 days, 2¹/₂ to 2³/₄ per cent.

Other Markets

Philadelphia Rapid Transit was the most interesting issue on the Philadelphia Exchange. The daily transactions ran into the thousands of shares. The price has not passed 36¹/₂, the mark reached last week, but the recessions from that figure have been only fractional. Union Traction was also active. Little interest was shown in Philadelphia Traction.

In the Boston market, Boston Suburban preferred sold at about 71 and Massachusetts Electric preferred around 72, representing the principal trading.

Traction issues have been a trifle more active in the Chicago market, Series 2 and 3 of the Chicago Railways issues being particularly strong.

In the Baltimore market, United Railways bonds continued to be in active demand and were fractionally higher.

The following traction securities were sold at the weekly security auction in New York: Virginia Passenger & Power Company, \$648,000 5 per cent bonds, Class A, at 60; \$475,000 Virginia Passenger & Power, Class C, at 90; 2567 shares Virginia Passenger & Power preferred stock, \$300 for lot; 856 shares Virginia Passenger & Power common, \$100 for lot; Southside Railway & Development Company, Richmond, Va., \$50,000 first mortgage bonds at 90; Richmond & Petersburg Electric Railway Company, 6000 shares at 25; Richmond & Petersburg Electric Railway, \$500,000 5 per cent bonds at 100.

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

	Apr. 27.	May 4.
American Railways Company.....	45	45 ¹ / ₂
Aurora, Elgin & Chicago Railroad (common).....	a38 ³ / ₄	*a38 ³ / ₄
Aurora, Elgin & Chicago Railroad (preferred).....	a88	*a88
Boston Elevated Railway.....	131	129
Boston & Suburban Electric Companies (common).....	*15	*15
Boston & Suburban Electric Companies (preferred).....	*70	*72
Boston & Worcester Electric Companies (common).....	12	12
Boston & Worcester Electric Companies (preferred).....	56	56 ¹ / ₂
Brooklyn Rapid Transit Company.....	76 ³ / ₄	78 ⁵ / ₈
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	85 ³ / ₄	86 ¹ / ₂
Capital Traction Company, Washington.....	a138 ¹ / ₂	137
Chicago City Railway.....	a190	*a190
Chicago & Oak Park Elevated Railroad (common).....	*a4 ¹ / ₂	*a4 ¹ / ₂
Chicago & Oak Park Elevated Railroad (preferred).....	*a11	*a11
Chicago Railways, pteptg. ctf. 1.....	*a110	a110
Chicago Railways, pteptg. ctf. 2.....	a40	a28
Chicago Railways, pteptg. ctf. 3.....	a27	a28
Chicago Railways, pteptg. ctf. 4.....	*a11	*a11 ¹ / ₂
Cleveland Electric Railway.....	*a78	*a78
Consolidated Traction Company of New Jersey.....	a77 ¹ / ₂	a77 ¹ / ₂
Consolidated Trac. Co. of N. J., 5 per cent bonds.....	a106 ¹ / ₂	a107 ¹ / ₄
Detroit United Railway.....	57	57
General Electric Company.....	158	159 ¹ / ₄
Georgia Railway & Electric Company (common).....	82	84
Georgia Railway & Electric Company (preferred).....	82	84
Interborough-Metropolitan Company (common).....	15 ⁵ / ₈	16 ⁷ / ₈
Interborough-Metropolitan Company (preferred).....	44 ³ / ₈	46 ³ / ₈
Interborough-Metropolitan Company (4 ¹ / ₂ s).....	78 ⁷ / ₈	80
Kansas City Railway & Light Company (common).....	a47 ³ / ₄	*a52
Kansas City Railway & Light Company (preferred).....	a82	*a83
Manhattan Railway.....	143 ³ / ₄	144 ⁷ / ₈
Massachusetts Electric Companies (common).....	13 ¹ / ₂	14
Massachusetts Electric Companies (preferred).....	71 ³ / ₄	71
Metropolitan West Side, Chicago (common).....	a19	a19
Metropolitan West Side, Chicago (preferred).....	a50 ¹ / ₂	a50 ¹ / ₂
Metropolitan Street Railway.....	26	26
Milwaukee Electric Railway & Light (preferred).....	*a110	*a110
North American Company.....	82	83 ¹ / ₄
Northwestern Elevated Railroad (common).....	a24	a24
Northwestern Elevated Railroad (preferred).....	a70	a71
Philadelphia Company, Pittsburg (common).....	41 ¹ / ₂	43 ¹ / ₂
Philadelphia Company, Pittsburg (preferred).....	41 ¹ / ₂	43
Philadelphia Rapid Transit Company.....	35 ³ / ₄	35 ³ / ₄
Philadelphia Traction Company.....	93 ³ / ₄	94
Public Service Corporation, 5 per cent. col. notes.....	a109 ¹ / ₄	a100 ¹ / ₂
Public Service Corporation, cfs.....	a81 ¹ / ₂	a84 ¹ / ₂
Seattle Electric Company (common).....	a91	*a91
Seattle Electric Company (preferred).....	a98	a98
South Side Elevated Railroad, Chicago.....	a56	a57
Toledo Railways & Light Company.....	12	12 ³ / ₄
Third Avenue Railroad, New York.....	32 ³ / ₄	34 ¹ / ₂
Twin City Rapid Transit, Minneapolis (common).....	*103 ¹ / ₂	103
Union Traction Company, Philadelphia.....	57 ¹ / ₄	58
United Railways & Electric Company, Baltimore.....	11	12 ¹ / ₄
United Railways Inv. Co., San Francisco (common).....	*37 ¹ / ₂	37 ¹ / ₄
United Railways Inv. Co., San Francisco (preferred).....	56	57 ³ / ₄
Washington Railway & Electric Company (common).....	a42 ³ / ₄	a41 ¹ / ₄
Washington Railway & Electric Company (preferred).....	a92 ³ / ₈	a92 ¹ / ₂
West End Street Railway, Boston (common).....	98	a98
West End Street Railway, Boston (preferred).....	111	*111
Westinghouse Electric & Manufacturing Company.....	81 ¹ / ₂	83 ¹ / ₄
Westinghouse Electric & Manufacturing (1st preferred).....	*119	120

a Asked. * Last sale.

Annual Report of New Orleans Railway & Light Company

Earnings of the New Orleans Railway & Light Company for the year ended Dec. 31, 1908, compare as follows with the preceding year:

	1908.	1907.
Operating revenue:		
Railroad department.....	\$4,033,788.95	\$4,094,216.31
Electric department.....	1,046,776.08	1,054,209.71
Gas department.....	887,933.23	851,304.90
Total.....	\$5,968,498.26	\$5,999,730.92
Operating expenses:		
Railroad department.....	\$2,468,366.34	\$2,440,710.01
Electric department.....	487,516.91	465,180.57
Gas department.....	409,101.39	381,822.11
Total.....	\$3,364,984.64	\$3,287,712.69
Net operating revenue.....	\$2,603,513.62	\$2,712,018.23
Deduct: Operating taxes.....	476,727.08	497,399.98
Net revenue from operation.....	\$2,126,786.54	\$2,214,618.25
Net non-operating revenue.....	10,497.40	9,178.83
Gross income for the year.....	\$2,137,283.94	\$2,223,797.08
Income deductions:		
Interest on funded debt.....	\$1,451,272.21	\$1,316,173.62
Other interest charges.....	68,188.23	150,387.52
Dividends on New Orleans City Railroad stock, in accordance with provisions of lease, proportion payable to minority stockholders.....	4,746.00	4,480.50
Amortization of commission on loans.....	26,388.88
Uncollectible accounts and unadjusted claims charged to current year's income.....	14,694.61	3,637.43
Other deductions from income.....	1,500.00	3,105.26
Total deductions from income.....	\$1,566,789.93	\$1,477,784.33
Net income for the year.....	\$570,494.01	\$746,012.75

Hugh McCloskey, the president, states in his report to shareholders:

"Thirty-five single-truck 20-ft. cars were purchased and placed in operation.

"Work on the bascule bridge over Bayou St. John at Esplanade Avenue was begun during the year and is progressing satisfactorily.

"There was expended during the year on power houses \$77,939, the largest part of which was for finishing up the construction of the central power station.

"The past year was one of stagnation in all business. The inauguration of the new transfer system on Jan. 16, 1908, caused the companies to carry 15,492,363 transfer passengers, against 7,590,597 the previous year, an increase of 7,901,766, or 104.1 per cent. Considering these conditions, it is with pride we call attention to the small percentage of decrease in earnings, which speaks so well for the earning power of the properties.

"It is pleasing to be able to assure you that the physical property and the equipment of the company in every branch have been maintained in a good state of repair and their efficiency considerably increased.

"On Dec. 3, 1908, the company sold 2400 of the 4¹/₂ per cent bonds held in its treasury to be delivered on June 20, 1909, so that on the date mentioned, the floating indebtedness of the company will be reduced by \$1,800,000."

The accounts were examined by Marwick, Mitchell & Company, who state in their report: "The income account fairly represents all the operations of the company, apart from depreciation, which has not yet been ascertained, though the expenditures for maintenance of way and equipment during the year have been made on a liberal scale."

Traffic statistics for three years compare as follows:

	1908.	1907.	1906.
Revenue passengers carried.....	77,459,499	78,879,204	73,606,068
Transfers redeemed.....	15,492,363	7,590,597	7,220,152
Revenue mileage.....	18,671,256	18,432,963	17,718,107
Eighteen-hour cars.....	115,605	113,648	108,637

Central Crosstown Railroad, New York, N. Y.—The holders of notes of the Central Crosstown Railroad are said to have reached an agreement with the receivers of the Metropolitan Street Railway by which the Central Crosstown Railroad will continue to be operated until May 1, 1910, under the arrangement whereby the Metropolitan Street Railway guarantees the payment of the fixed charges in lieu of a dividend rental in addition, as called for by the lease.

Chicago (Ill.) Consolidated Traction Company.—The proposition of assessing bondholders of the Chicago Consolidated Traction Company for improvements was discussed before Judge Grosscup in Chicago on April 26. The various companies are not now earning sufficient funds to carry out the provisions of their ordinances requiring pavement and improvements. The question of authorizing receivers' certificates by the various companies to carry out improvements required was also discussed.

Dayton & Xenia Transit Company, Dayton, Ohio.—Thomas A. Ferneding, receiver of the Dayton & Xenia

Transit Company, has applied to the United States Court at Cincinnati to fix a date for the sale of property of the company. It is understood that the Dayton, Springfield & Xenia Southern Traction Company, recently incorporated, will be a bidder for the property of the Dayton & Xenia Transit Company. The officers of the Dayton, Springfield & Xenia Southern Traction Company are: Thomas A. Ferneding, president; W. S. McConnaughey, secretary and treasurer; John C. Shea, John Kepler and R. J. Wells, Dayton, directors.

Hudson & Manhattan Railroad, New York, N. Y.—The names of the 20 largest stockholders of the Hudson & Manhattan Railroad, with the number of shares held by them on June 30, 1908, are given in a supplementary report which has been submitted to the Public Service Commission of the First District of New York, as follows: Hudson Companies, 128,678 shares common and 15,750 shares preferred, total, 144,428. Simpson, Thacher & Bartlett, trustees, 136,684 common; Dumont Clarke, Pliny Fisk and W. M. Barnum, 71,250 common; Hudson Improvement Company, 32,588 common and 6037 preferred, total, 38,625; Harvey Fisk & Sons, 7091 common and 11,359 preferred, total, 18,450; F. W. Walz, 8508 common and 5595 preferred, total, 14,103; W. G. Oakman, 6704 common and 724 preferred, total, 7428; J. P. Morgan & Company, 6666 preferred; First National Bank of New York, 3333 preferred; C. T. Ellis, 3464 common and 2266 preferred, total, 5730. Following are prominent holders of common stock: W. H. Barnum, 1299; F. H. Sillick, 66; W. G. McAdoo, 32; F. B. Jennings, 33; E. H. Gary, 32; E. C. Converse, 32; A. N. Brady, 32; J. G. Cullough, 32; G. Tracy Rogers, 22, and E. F. C. Young, 22 shares.

Interstate Railways, Philadelphia, Pa.—The Real Estate Title & Trust Company, Philadelphia, trustee for the \$10,776,600 of 4 per cent bonds of the Interstate Railways, announced on April 29 that it had been officially notified that the coupons defaulted on Feb. 1 would be paid, and that funds for that purpose would be deposited with it before May 1, thus preventing foreclosure proceedings. The Philadelphia *Financial News* says: "It appears probable that George H. Earle, Jr., Richard Y. Cook, Samuel F. Houston and James F. Sullivan, either individually or through the institutions with which they are identified, will hereafter be important factors in the company's affairs, possibly through the acquisition of a majority of the \$2,500,000 common stock." Before this announcement more than two-thirds of the entire issue of 4 per cent bonds of the Interstate Railways had been deposited with the Philadelphia Trust Company. This was done in accordance with the plan of reorganization which was proposed by the firm of Edward B. Smith & Company.

Quebec Railway, Light & Power Company, Quebec, Que.—Control of the Quebec Railway, Light & Power Company is said to have been sold to a syndicate of shareholders which has arranged to extend the road from its present terminus at St. Joachim to Murray Bay, 56 miles. Construction will begin this summer and the cost of the line will be more than \$2,000,000, for which bonds will be underwritten.

Toledo Railways & Light Company, Toledo, Ohio.—The stockholders of the Toledo Railways & Light Company have selected the following committee to represent them in the refinancing and reorganization that are contemplated: J. K. Secor, Toledo; W. E. Hutton, Cincinnati; Dr. Joseph F. Demers, Quebec; Joseph M. Spencer, Toledo, and F. H. Goff, Cleveland. Mr. Goff will act for Henry A. Everett, Cleveland, as Mr. Everett's health will not permit him to take part in the work that will devolve upon the committee.

United Railways Investment Company, San Francisco, Cal.—A special meeting of the stockholders of the United Railways Investment Company will be held on May 17 to vote on the following matters: (1) Increase the capital stock from \$50,000,000, or the preferred from \$15,000,000 to \$20,000,000, and the common from \$25,000,000 to \$30,000,000. (2) To provide that no part of the authorized increase in the preferred stock shall be issued except by an affirmative majority vote of the entire capital stock. (3) To ratify the acquisition of the Stanislaus Power Company under the plan of Jan. 14, 1909. (4) To authorize the issue of \$1,000,000 of each of the preferred and common stocks for the purchase of the Stanislaus company. (5) To authorize the sale of \$10,000,000 of the company's holdings in the common stock of the United Railroads of San Francisco to a new corporation, all of the capital stock of which is to be held by the investment company. (6) To determine the compensation of a committee of the directors for effecting the purchase of the property of the Stanislaus Power Company.

Traffic and Transportation

Recommendations Regarding Service in Pittsburg

The Railroad Commission of Pennsylvania has made public its recommendations regarding street railway service in Pittsburg based largely on the report made to the commission by Stone & Webster, Boston, Mass., whose conclusions were published in the *ELECTRIC RAILWAY JOURNAL* of March 20, 1909, page 528.

The Railroad Commission in its report refers to the peculiar peninsular form of the city and the difficulties which are offered to advantageous operation, and concludes that "on account of the peculiar conditions that obtain the periods of maximum load during rush hours are, perhaps, shorter and sharper in Pittsburg than in any other city in the country." The inadequacy of the bridges and the barriers which grade crossings impose are shown to restrict the size of cars and to work serious hardships by causing delays. The commission plotted curves from the data furnished by the company regarding the number of passengers carried per car, the size and capacity of the cars and the number of cars operated each hour which give a general idea of the relation between the seats furnished and the passengers carried on the whole system during a day of 24 hours. The commission concludes that "the data indicate that the seating capacity except during the short periods in the morning and evening known as the rush hours is adequate for the present amount of travel."

The recommendations of the commission follow: "First—That additional service be provided by the railways company during the period commonly known as the 'rush hours' on the following routes and to the exact amount indicated opposite each:

Route	Designation	Trippers Per Hour
203	Heidelberg	3
204	Crafton-Ingram	3
205	Crafton-Thornburg	3
213	Mount Washington via Tunnel.....	6
307	Arlington Avenue.....	4
403	Wilmerding via Homestead.....	2
706	Wilkinsburg via Frankstown Avenue.....	5
714	East Liberty Express via Liberty Avenue..	5
1001	Sharpsburg via Penn Avenue.....	5
104	California Avenue to Avalon and Emsworth	4
207	Elliott and Sheraden.....	4
303	Knoxville via Tunnel.....	6
901	Wylie, Bedford and Herron avenues.....	5

"The maximum number of cars on the most congested loop with this increased schedule would be 120 per hour. Car movements will necessarily have to be facilitated in every possible way to get satisfactory service from this headway, and the actual schedule of the different routes may have to be modified to properly take care of the increased number of cars; this, however, is an operating matter to be worked out by the traffic department of the company.

"The above recommendation is made on the assumption that the company will use the same type of cars on the various routes as are now in use thereon, but wherever possible, the long, double-truck cars should be substituted for the smaller ones, and a still greater improvement in the service would thus be effected.

"Second—That the company station inspectors at every important point and that, as far as practicable, the municipal authorities secure to these inspectors the authority to regulate the headways of cars on the various lines, to the end that a closer adherence to schedule may be maintained.

"Third—That at all important junctions in the terminal district electrically operated switches be introduced, or that the switches now in place be operated by employees of the company other than those engaged in the operation of the cars.

"Fourth—That the company endeavor to at once improve the lighting arrangements in the short cars, and give more careful attention to the heating and ventilation of all cars.

"Fifth—That every legitimate effort should be made to secure the speedy abolition of all grade crossings of steam railroad lines."

Fender Order Issued in New York

The Public Service Commission of the First District of New York, on April 28, issued orders to the street railways in Greater New York to equip all their cars, except those operated by animal power, with wheel guards or fenders of a type to be approved by the commission. The companies in Brooklyn are given further time to experiment with different types of wheel guards, but meantime

must comply with the order for fenders of a type approved by the commission. The companies in the boroughs of Manhattan and the Bronx must install wheel guards on all their cars by Aug. 1, 1909, and submit to the commission by May 15 for approval drawings and specifications of the device to be used. The companies in Brooklyn and Queens are required to equip all their cars in service with fenders by July 1, 1909, and to submit drawings and specifications for the approval of the commission by May 15. The Staten Island Midland Railway and the Richmond Light & Railroad Company, which operate in Richmond Borough, are ordered to install both fenders and wheel guards on their cars by July 15, and to submit drawings and specifications for approval by May 5. This action was taken in accordance with the recommendations of a report made by Commissioner Milo R. Maltbie, who held hearings upon the subject after the sub-committee on safety devices had reported the results of the fender and wheel-guard tests held by the commission in Schenectady and Pittsburgh. These tests were reported in detail in the *ELECTRIC RAILWAY JOURNAL*, the findings of the commission being abstracted in the issue of Feb. 6, 1909.

An abstract of Commissioner Maltbie's report follows: "The relative efficiency of fenders and wheel guards depends, to some degree, upon traffic and operating conditions. In congested districts where the cars are operated at low speeds, automatic wheel guards are efficient. In suburban or rural districts where cars are operated at high speeds certain types of fenders perform a function which wheel guards cannot perform, but the experiments of the commission and the experience of street railway companies show that in many cases no fender yet devised will always pick up a prostrate body. In other words, fenders perform certain functions which wheel guards cannot perform, and wheel guards perform certain functions which fenders cannot perform.

"In view of the variations in local conditions the orders adopted by the commission differ somewhat in the several boroughs. All of the street cars operated in Manhattan and the Bronx, except those propelled by animal power, must be equipped with wheel guards, one at each end of the car. It is possible that it will be found necessary at some future time to require that cars upon certain lines in the Bronx, and possibly in the northern portion of Manhattan, be equipped also with fenders; but until more experience has been had with continuous operation of wheel guards, it is impossible to determine whether fenders will be necessary and what device or devices could be used to best advantage.

"The cars operated in the Borough of Richmond must be equipped with both wheel guards and fenders, and the companies have expressed a willingness to do so.

"In Brooklyn and Queens most of the lines operate through narrow congested streets and sparsely settled districts. In Queens many of the streets are not paved, the level of the ground between the rails being considerably below the level of the rails. It is evident that where such a condition exists, a wheel guard will not be effective. The cars operated by the companies in Queens and in Brooklyn are equipped with fenders, and the companies have urged that they be given an opportunity to test a number of devices upon their various types of cars in order to determine which ones are suited to their conditions. In view of the local peculiarities, the various types of cars operated and the condition of the tracks, it is thought that such experiments should be allowed and that until these have been made the companies should merely be required to equip their cars with a type of fender approved by the commission."

The companies operating in Brooklyn are given permission to experiment with various types of wheel guards until Nov. 1, 1909, when the commission will either confirm its order for the use of fenders throughout that territory, or wheel guards, or a combination of both fenders and wheel guards.

Traffic Charts and Exhibits of New York

The Public Service Commission of the First District of New York has on exhibition at the City Planning and Municipal Art Exhibition, in the Twenty-second Regiment Armory, New York, a graphic chart showing the hourly ticket sales on the various transportation lines in Greater New York. The chart consists of a map showing the subway and elevated lines in Manhattan and the Bronx, and the bridges and ferries to Brooklyn, mounted upon a board which sets on a table. Imposed upon the map, at various points, are blocks of wood, cut in profile to show the number of ticket sales at each point for every hour in the day. The count upon which these profile blocks were

based was made on an average day, Feb. 17, 1909. The number of tickets sold each hour of the 24 was ascertained and the blocks to represent this number were cut in steps, from the lowest level, which is 200 an hour, up to the highest, which was 20,000 tickets in one hour. The resulting elevation to indicate this large total makes the block representing it appear like a skyscraper towering over the other blocks. The station at which this highest record was made was at the Manhattan terminal of the Brooklyn Bridge and represents the largest hourly sale of tickets during the height of the evening rush hour. The next highest point reached was 11,000 for one hour, which was the maximum of sales at the Atlantic Avenue (Brooklyn) station of the subway and represents the peak of the ticket sales during the morning rush hours from Brooklyn to Manhattan.

An unlooked-for development was the discovery that the hourly ticket sales, or fares, on the surface railways crossing the Williamsburg Bridge were nearly as large as those on the surface railways of the Brooklyn Bridge during the evening rush hours. The chart also shows that the ticket sales in the morning on the Lenox branch of the subway are much heavier than those on the Broadway division of the same line.

The figures for hourly ticket sales in the subway on Feb. 17, 1909, the day on which the count was made, follow:

	Morning.	Evening.
Atlantic Avenue Subway Station (Brooklyn).....	10,900	1,304
News Street	2,816	511
Hoyt Street	2,320	667
Borough Hall	4,100	1,100
South Ferry	503	305
Wall Street	703	6,025
Fulton Street	1,480	7,076
Brooklyn Bridge	6,303	5,208
Fourteenth Street	1,701	6,510
Twenty-third Street	902	5,225
Grand Central	4,800	3,905
Times Square	1,300	6,025
Seventy-second Street	1,801	906
Ninety-sixth Street	2,605	605
137th Street	1,800	410
181st Street	1,500	590
Dyckman Street	130	100
207th Street	60	42
215th Street	4	5
225th Street	140	71
231st Street	112	20
242d Street	500	240
110th Street (Lenox).....	4,000	400
116th Street (Lenox).....	3,000	651
125th Street (Lenox).....	1,800	1,043
135th Street (Lenox).....	2,110	461
145th Street (Lenox).....	700	200
Mott Avenue (Lenox).....	200	160
Prospect Avenue (Lenox).....	1,505	621
180th Street (Lenox).....	280	90

The commission also has on exhibition two maps showing the number of railroad and street railway accidents in Manhattan, the Bronx and Brooklyn for a period of 20 months, from Aug. 5, 1907, to May 1, 1909. The map of Manhattan and the Bronx shows that during the period 511 persons were struck by cars and killed or injured, that there were 330 collisions between cars, and 295 collisions between cars and vehicles. These maps show that accidents are relatively fewer where the congestion is greatest on account of the necessity of slow operation in such districts. The map of Manhattan shows that the section south of Canal Street and Grand Street is the safest in the city, and that accidents on the Second Avenue and Third Avenue lines are more numerous than on Madison Avenue. This is probably due to the elevated pillars in the street along the Second Avenue and Third Avenue lines. The map of Brooklyn shows that 246 persons were struck by cars and killed or injured; that there were 87 collisions between cars and 137 collisions between cars and vehicles.

Other exhibits show in graphic charts and maps the population, fare, time and distance by various transportation lines in Greater New York, the surface lines, routes, density and origin of traffic, and the distribution of traffic inbound and outbound.

More Pay-as-You-Enter Cars in New York.—The Metropolitan Street Railway, New York, has recently placed 60 pay-as-you-enter cars in service on its Eighth Avenue line. This is the second line of the company on which pay-as-you-enter cars have been adopted, and the entire service on the line will be given with this type of car as soon as the additional cars needed to meet the schedule can be prepared for service.

Additional Limited Service Between Fort Wayne and Indianapolis.—The Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind., and the Indiana Union Traction Company, Anderson, Ind., have arranged to put 20 limited cars and several additional freight trains in opera-

tion between Fort Wayne and Indianapolis on May 16. Traffic will be divided between the Peru and the Bluffton divisions. It is proposed, however, materially to reduce the running time over the Bluffton route.

Columbus Terminal.—Business men in Columbus, Ohio, are endeavoring to persuade the Ohio Electric Railway to erect a central station building in the business part of the city with funds that they say can be secured locally instead of building a freight and passenger station at Third Street and Rich Street, as has been proposed by the company. A 15-story building is proposed, the first floor to be used for passenger purposes, the second for the railroad offices and the others to be rented for general office purposes. The locations suggested are Third Street and Gay Street, Gay Street west of High Street, where the present station of the railway is located, and Long Street and Front Street.

Merchants' Report on the San Francisco Railways.—Under the auspices of the Merchants' Association of San Francisco, an inspection of the service and facilities of the United Railroads of San Francisco has been conducted. The report has just been presented and is a pamphlet of 36 pages. Suggestions or remarks, for the most part of local interest, are submitted on each of the lines of the company. The most important suggestion is the substitution of longitudinal seats for cross seats on the lines of heavy traffic, the purpose being to provide more standing space with the same number of seats. The report has been referred to the street railway committee of the Merchants' Association for its consideration.

Ohio Commission Asks for Schedules.—Passenger agents of the various electric railways in Ohio have received letters from the State Railroad Commission requesting them to file schedules showing the fares and distances between stops with the commission by July 10. The Ohio Electric Railway has 1000 stops outside of municipalities, and W. C. Whitney, general passenger agent, has estimated that 12 clerks, working eight hours a day for two months, would be required to compile the information desired at a cost of from \$1,750 to \$2,000. Several of the companies have already taken the matter up with the commission in the hope that the original order may be so modified as to lighten the task for the companies.

Petition for Reduction of Fare in Massachusetts Dismissed.—The Mayor and the City Solicitor of Salem, Mass., recently petitioned the Railroad Commission of Massachusetts for a reduction of fares on the Boston & Northern Street Railway between Salem and Lynn and between Salem and Boston via Highland Avenue. The established fares by these routes are 10 cents and 20 cents, respectively. The Highland Avenue line, so-called, was built to enable the company to operate through cars at high speed from Town House Square, Salem, to Boston. A careful study of the capital outlay for the construction of this line was made by the commission, which has decided that in view of the total receipts for the character of service rendered the fares complained of are not unreasonable. The commission therefore finds no reason for making any recommendation to the company.

Albany Company Required Completely to Vestibule Cars.—The Public Service Commission of the Second District of New York has issued an order requiring the United Traction Company, Albany, N. Y., completely to vestibule its cars. The commission says that Section 111 of the Railroad Law, which prescribes that "the front and rear platforms of every car * * * shall be inclosed from the front and at least one side of the platform to the hood" is intended to require a minimum standard of protection, and does not prevent the commission from prescribing such further protection as may be proved necessary. The order of the commission follows: "That the United Traction Company be and it is hereby directed completely to inclose or vestibule the front and rear platforms of all closed motor passenger cars to be operated by it in Albany and Rensselaer counties during December, January, February and March, and to complete before Nov. 1, 1909, the changes in such cars necessary to enable said company to comply with this order; and that said inclosures or vestibules shall be properly constructed of iron, wood and glass, with doors therein to allow of entering or leaving the platforms so inclosed or vestibuled. That during said months in the future the platforms of all closed motor passenger cars operated by said company in said counties shall be found to be so inclosed or vestibuled. That this order shall take effect upon the service of a certified copy thereof on said United Traction Company, and shall continue in force until modified or abrogated by this commission. That said United Traction Company shall notify this commission on or before May 10, 1909, whether the terms of this order are accepted and will be obeyed by it."

Personal Mention

Mr. L. H. Palmer, formerly assistant to the general manager, Metropolitan Street Railway, New York, has been appointed superintendent of transportation. Mr. Palmer has been performing the duties of the latter office for some time.

Mr. Walter A. Pearson sailed on the *Lusitania* last week via Southampton for Rio de Janeiro, South America, where he will take up his duties as assistant general manager of the Rio de Janeiro Tramway, Light & Power Company. Mr. Pearson was tendered a farewell dinner by a number of his friends at the Machinery Club in New York before his departure.

Mr. Jesse F. Orton has been appointed secretary to Mr. Milo Roy Maltbie of the Public Service Commission of the First District of New York to succeed Mr. Fay N. Seaton, resigned. Mr. Orton had been secretary of the tariff reform committee of the Reform Club. He is a graduate of the University of Michigan and of Cornell University and has practised law for about 10 years.

Mr. Richard T. Laffin has become associated with the Stone & Webster Management Association, Boston, Mass., in connection with the Seattle Electric Company and other Puget Sound railway and lighting properties. Mr. Laffin was for many years connected with the Boston (Mass.) Elevated Railway, and was later general manager of the Worcester (Mass.) Consolidated Street Railway. He resigned from the latter company to become vice-president and general manager of the Manila Electric Railroad & Light Company, Manila, P. I., and spent about four years in the Philippines, doing much of the work of establishing and organizing the property. He has returned to this country only recently.

Mr. John Powers, who at the time of the organization of the Eastern Wisconsin Railway & Light Company was appointed chief engineer of the company, accepted that position after resigning as chief engineer of the Winnebago Traction Company, of Oshkosh, Wis. Mr. Powers has been engaged in the electric railway business for the past 20 years and has engaged in both operation and construction. For five years he served as superintendent of the Sterling, Dixon & Eastern Electric Railway Company; later he took active part in the construction of the Watertown a. c. section of the Milwaukee Electric Railway & Light Company and was afterward superintendent of overhead construction for the McKinley syndicate at Galesburg, Ill.

Mr. S. D. Wager, who recently resigned as master mechanic of the Toledo, Port Clinton & Lake Side Railway, Genoa, Ohio, has been appointed general shop foreman of the Northern Ohio Traction & Light Company at Canton, Ohio. Mr. Wager began his railroad career in 1891 and since that time has been connected with the Lake Shore & Michigan Southern Railroad, Chicago, Rock Island & Pacific Railroad, Missouri, Kansas & Texas Railroad, Toledo & Indiana Railway and the Toledo, Port Clinton & Lake Side Railway. On June 15, 1906, Mr. Wager was appointed chief train dispatcher of the Toledo, Port Clinton & Lake Side Railway and on Nov. 15, 1907, he was promoted to general shop foreman. In July, 1908, he was made master mechanic of the Toledo, Port Clinton & Lake Side Railway.

Mr. Charles B. Scott, whose appointment as assistant general manager of the Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Light Company, New Albany, Ind., was noted in the *ELECTRIC RAILWAY JOURNAL* of May 1, 1909, became connected with these companies as claim agent on Jan. 1, 1907. On assuming the duties of claim agent of the company, special efforts were made by Mr. Scott to reduce the number of accidents. He introduced a thorough system of inspection of equipment and impressed upon the men in the operating department their individual responsibility. The position to which Mr. Scott has recently been appointed was especially created, and Mr. Scott will continue to have charge of the claim department and of all litigation growing out of claims against the company. Aside from the duties which he formerly performed, Mr. Scott will assist Martin J. Insull, general manager of the company, in the general duties of that office.

Mr. M. F. Flatley has been appointed master mechanic of the Rochester, Syracuse & Eastern Railway, Syracuse, N. Y., effective May 1. Mr. Flatley has had wide experience in the mechanical departments of electric railways, especially with heavy motor equipment and multiple-unit control apparatus. He entered the employ of the Twin City Rapid Transit Company 18 years ago and remained there for seven years. He then was employed for a number of

years by the Westinghouse Electric & Manufacturing Company on construction work. He left this company to accept a position with the Interborough Rapid Transit Company, which was then carrying on the electrification of the elevated lines in New York City. Five years ago Mr. Flatley went to the Brooklyn Rapid Transit Company, where he has held various positions in the mechanical department. At the time of his appointment as master mechanic of the Rochester, Syracuse & Eastern Railway he was foreman of the Fresh Pond elevated shop of the Brooklyn Rapid Transit Company.

OBITUARY

Henry D. Smith, secretary and treasurer of the Wisconsin Traction, Heat, Light & Power Company, Appleton, Wis., is dead. Mr. Smith was prominent in financial and business circles of the Middle West and was president of the First National Bank of Appleton and president of the Riverside Fiber & Paper Company.

NEW PUBLICATIONS

Manual of Electrical Undertakings and Directory of Officials for 1909, compiled by Emile Garcke. London: Electrical Press, Ltd. Price, 21 shillings, net.

This is the thirteenth annual volume of Garcke's Manual and contains statistical and general information, including names of officials, relating to nearly 3000 electrical enterprises in the United Kingdom and the British Colonies. In many cases comparative summaries are given covering financial results and other statistics of the electric lighting and tramway undertakings. In the general statistical tables it is interesting to note that the increase in capitalization of private traction undertakings has been £9,300,000, as compared with £15,770,000 last year. A large part of the increase this year is accounted for by the steam electrification of the Midland Railway and South London Railway. The increased investment in municipal traction undertakings has been £328,000, as compared with £5,770,000 last year. The average dividends paid on traction undertakings was 2.97 per cent, as compared with 3.62 per cent last year, but here also an outside factor must be considered, the inclusion for the first time of a large amount of tube railway capital. The revenue from passenger traffic of all the municipal tramways has increased 9.1 per cent, and in the case of the private companies has decreased 1½ per cent.

Heavy Electrical Engineering. By H. M. Hobart. New York: D. Van Nostrand & Co., 338 pages. \$4.50, net.

The book under review is a natural extension of the joint work of the author and Mr. Parshall, on "Electric Railway Engineering," to which there are occasional references in the text. If one reads the preface before the body of the book, he will expect to find considerable space devoted to a discussion of the single-phase "mania." Nor will he be disappointed upon reaching the later pages. The single-phase motor is a monstrosity (spelled in large type), it is a delusion and a discredit to electrical engineering. The author prefers for heavy traction work 3000 volts and a third-rail. All of the book, however, is not taken up by the author's discussion of motors. There are six chapters on generating stations, two on transmission lines, one on electric traction calculations and one on motors. The chapter on calculations is devoted largely to a development of the author's formulas for train resistance in tube railways and in the open, in both of which the usual second term depending on the first power of V is omitted. These formulas, more particularly the second, are later plotted in a series of curves to show the watt-hours per ton-mile for various degrees of acceleration, rates of speed, duration and frequency of stop, etc., as well as the average input in kilowatts per ton.

The Public Service Commission of the First District of New York on May 4 approved the application of the Hudson & Manhattan Railroad for an extension of its subway from the original terminus at Thirty-third Street and Sixth Avenue, New York, to the Grand Central Station, at Fourth Avenue and Forty-second Street. The franchise now goes to the Board of Estimate for action, and in that body 12 out of the 16 votes are necessary to pass it on the first call. Failing to receive the required number on the first call, the franchise may be taken up on a second call and passed by a majority vote. The franchise by the Public Service Commission is similar to the intermediate grant to the Hudson & Manhattan Railroad by the Rapid Transit Commission. The principal terms of the franchise were given on page 745 of the issue of the ELECTRIC RAILWAY JOURNAL of April 17, 1909. Three stations are to be included on the new line, instead of the two originally planned. One is at Sixth Avenue and Thirty-eighth Street, one at Fifth Avenue and Forty-second Street, and the other is the terminal station at the Grand Central.

Construction News

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

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

RECENT INCORPORATIONS

***Sacramento & Sierra Railroad, Sacramento, Cal.**—Incorporated to construct an electric railway from Sacramento to Lake Tahoe via Orangeville, Georgetown and Jackson Springs, 126½ miles. Rights of way have been secured and the surveys are completed. Capital stock, \$1,000,000. B. F. Hulings, Sacramento, local representative.

***St. Louis & Chester Railway, East St. Louis, Ill.**—Incorporated to build an electric railway from East St. Louis to Chester, passing through the counties of St. Clair, Monroe and Randolph. Principal office, East St. Louis. Capital stock, \$100,000. Incorporators: Rudolph Stecher, Murphysboro; Eugene W. Ziegenhein, Richard A. Stack, East St. Louis; Edward Schiwitz, William F. Bentzen, St. Louis, Mo.

***Shore Line Traction Company, Indianapolis, Ind.**—Incorporated to construct and operate an electric railway in Indiana. The articles of incorporation do not disclose where the promoters will build the line, but it is understood that it will be constructed from Indianapolis southeast to Beach Grove, a distance of 8 miles. Headquarters, Indianapolis. Capital stock, \$10,000. Directors: Joseph F. Weber, Frank T. Edenharter and George F. Mull.

***Triborough Railroad, New York, N. Y.**—Incorporated to operate a double-track electric street railway, 2½ miles long, from the intersection of Canal, Walker and Baxter Streets, in Manhattan Borough, to the intersection of Fulton Street with Flatbush Avenue extension, Brooklyn. Capital stock, \$50,000. Directors: William Bradley, James E. Gaffney, Henry Steers, New York, and William E. Bolte, Maywood, N. J. Back of this project are the same interests which are represented in the Bradley-Gaffney-Steers Contracting Company, which applied recently to the Public Service Commission for permission to build a Lexington Avenue subway from the Bronx to the Brooklyn Bridge.

FRANCHISES

Phoenix, Ariz.—The Suburban Railway has been granted a franchise to construct an electric street railway in Phoenix by a vote of 764 to 51. F. J. Bennett and Homer B. King are said to be interested in this company. [E. R. J., March 20, '09.]

Fresno, Cal.—F. S. Granger, representing the Fresno, Hanford & Summit Lake Interurban Railway, has applied to the Board of Supervisors for a 50-year franchise for an electric railway over certain streets in Fresno County. [E. R. J., March 20, '09.]

Wilmington, Cal.—The City Council has granted the Pacific Electric Railway an extension of its franchise for completing its track around the west bay until Sept. 5.

Wilmington, Del.—The People's Railway has been granted a franchise to extend its tracks on East Fourth Street, from Church to Bridge Street.

Kansas City, Mo.—The City Council has granted the Kansas City, St. Joseph & Excelsior Springs Railway an extension of two years' time, until May 22, 1912, in which to begin the construction of its proposed 110-mile electric railway from Kansas City to Excelsior Springs. [E. R. J., Jan. 9, '09.]

Atlantic City, N. J.—The Venice Park Railroad, the incorporation papers for which will be filed within a few days, has made application to the City Council for a franchise to build a street railway from Ohio Avenue to Gramercy Avenue, a distance of about 1 mile.

Allentown, Pa.—The Inter-County Electric Company, Topton, which proposes to construct an electric railway from Reading to Allentown via Lyons and Tipton, has applied to the Allentown Council for a franchise to build its proposed line over certain streets in Allentown.

***Pittsburg, Pa.**—An ordinance has been introduced in the Select Council by C. C. Kohne which provides for the construction of a tunnel, to start at Seventh Avenue and the Grant Boulevard, to extend under the hill to Center Avenue and Craig Street.

Nashville, Tenn.—The Nashville Railway & Light Company has applied to the City Council for a franchise to extend its tracks out Broadway and the Hillsboro Pike.

Sherman, Tex.—The City Council has granted a franchise to the Texas Traction Company permitting it to connect its tracks with those of the Denison & Sherman Railway and to operate its cars over the lines of the latter road. As a consideration for this the Texas Traction Company

agrees by April 1, 1910, to build and operate lateral or local service lines in West Lamar Street and Cemetery Avenue.

Bellingham, Wash.—A franchise has been granted to the Whatcom County Railway & Lighting Company permitting it to build lines on Dock Street and on North Street.

Colfax, Wash.—The County Commissioners have revoked the franchise held by the Whitman Railroad & Power Company to build and operate an electric railway between Colfax and Palouse.

Spokane, Wash.—Application has been made to the City Council by the Spokane & Inland Empire Railroad for franchises covering 3 miles of new track in Spokane.

Spokane, Wash.—Application has been made to the City Council by the Washington Water Power Company for a franchise to build a line about 1 mile in length from Princeton Avenue and Nevada Street, the present terminal of the Astor and Lidgerwood lines, northerly on Nevada Street to Rowan Avenue.

TRACK AND ROADWAY

***Corning, Ark.**—It is reported that D. W. Reynolds and J. Pickrell, Louisville, Ky., are interested in a proposition to build an electric railway from Corning to Maynard, a distance of 18 miles.

Pacific Electric Railway, Los Angeles, Cal.—Announcement is made that construction work will soon be started by this company on the extension of its line from Santa Ana to Huntingdon Beach.

Ontario & San Antonio Heights Railroad, Ontario, Cal.—Rights of way are being procured by this company for an extension to be constructed between Uplands and Claremont, a distance of about 6 miles.

Shore Line Electric Railway, New Haven, Conn.—This company has awarded to T. A. Scott & Son, New London, the contract to drive piles for the trestle across Middle Cove Bay.

Washington, Spa Springs & Greta Railroad, Washington, D. C.—This company has recently begun construction work on its proposed electric railway from Fifteenth Street and H Street in Washington to Bladensburg, Riverdale and Berwyn Heights, 10½ miles. About 2½ miles of track will be laid in Washington. Headquarters, 419 National Metropolitan Bank Building, Washington. Officers: S. S. Yoder, Washington, president; W. W. Poultny, secretary; W. C. Brown, treasurer; C. D. Eldridge, electrical engineer. [E. R. J., April 10, '09.]

***Savannah, Ga.**—It is stated that T. D. Heywood and Neils Christensen, Beaufort, S. C., are at the head of a movement to construct an electric railway from Savannah to Bluffton and then to Charleston.

Lewiston (Idaho) Terminal Company.—Announcement is made that this company is completing arrangements for starting construction work on its proposed terminal in Lewiston within 30 days. About 6300 ft. of track will be constructed and will be subject to interurban railways desiring to enter the city. David Guland, chief engineer. [E. R. J., April 17, '09.]

East St. Louis, Columbia & Waterloo Railway, Columbia, Ill.—This company advises that it plans to begin construction work during this month on its proposed 23-mile electric railway which is to connect East St. Louis, Dupo, Bixley, Columbia and Waterloo. Falling Springs, an amusement resort, will be reached by the line. It is proposed to furnish power for lighting. Capital stock authorized and issued, \$10,000. H. Rechenbach, Columbia, secretary-treasurer; Baxter Brown, 610 Laeledge Building, St. Louis, Mo., chief engineer. [E. R. J., March 13, '09.]

Murphysboro (Ill.) Street Railway.—This company has awarded to the Westinghouse Electric & Manufacturing Company the contract for poles, wires, etc.

Auburn & Turner Railroad, Lewiston, Maine.—It is reported that this company plans to extend its line from Turner Village to Livermore Falls. Two routes have been proposed—one following up the river and the other going from Turner Village to North Turner, to Livermore, to North Livermore, to Livermore Falls.

Bangor Railway & Electric Company, Bangor, Maine.—This company is said to have ordered a preliminary survey for an extension to the Charleston division of the lines running from Bangor, which will eventually reach Waterville, 52 miles west of Bangor. The extension will begin at East Corinth and will extend to Dexter, thence through the towns of St. Albans, Hartland and Canaan, skirting Moose Pond, to Skowhegan; thence over the rails of the Somerset Traction Company, if it can be purchased, or if not, by independent line to Waterville. This proposed road will link Bangor, by trunk line, to the westward. In connection with

the new road a branch line from Dexter north to Dover and Foxcroft is contemplated.

Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md.—It is rumored that this company is planning to extend its line through Eastport to Bay Ridge and connect with Arundel-on-the-Bay, a small summer resort about 5 miles from Annapolis.

Springfield (Mass.) Street Railway.—This company, it is reported, will expend about \$80,000 in new tracks, wires and electrical equipment and other improvements during the coming season.

Escanaba (Mich.) Electric Street Railway.—It is said that this company contemplates extending its line from Escanaba and Wells to Rapid River via Gladstone.

Gallatin Valley Electric Railway, Bozeman, Mont.—It is announced that this company has definitely decided upon the route for its proposed electric railway between Bozeman and Salesville, 18 miles. The terminal and yards will be located on the outskirts of Bozeman. It is stated that the company has completed arrangements to take over the Bozeman Street Railway and operate it in connection with its proposed interurban railway. The contract for building and equipping the line has been let to Westinghouse, Church, Kerr & Company, New York, N. Y. Contracts for the grading have been sublet to D. J. Burke and to Locke & Dier, Bozeman, for the engineering work. A. J. Busch has been appointed superintendent of track work by the company.

Interstate Railway, Kansas City, Mo.—This company, which proposes to build an electric interurban railway between Kansas City and St. Joseph, and which has secured from the property owners about 80 per cent of the right of way between the two points, has filed injunction proceedings against the Missouri River & Cameron Railroad, enjoining and restraining it from attempting to build over the right of way of the Interstate Railway and from molesting the contracts for deeds heretofore secured from the land owners by the plaintiff company. The company has also begun condemnation proceedings in Circuit Courts of the counties of Platte and Buchanan in order to perfect its right of way not already contracted for, and is preparing to begin construction of its line. The company reports that it is to build a standard gage electric railway on a 7-10 of 1 per cent grade and with no curve sharper than 3 per cent. Headquarters, 735 New York Life Building, Kansas City. S. P. Martin, secretary. [E. R. J., April 3, '09.]

Ithaca (N. Y.) Street Railway.—This company expects to commence the reconstruction of its line on June 1, 1909. The entire railway will be double tracked and the overhead work will be entirely rebuilt. The Pennsylvania Steel Company, Steelton, Pa., has been awarded the contract for the rails, and the Electric Service Supplies Company, Philadelphia, will furnish all the insulators, etc., necessary for the rebuilding of the overhead work.

Grand Forks (N. D.) Street Railway.—This company expects to place contracts during the next four weeks for the construction of 3½ miles of new track. T. D. Campbell, general manager.

Turkey Foot Traction Company, Akron, Ohio.—Thomas L. Childs, chief promoter of the plan to build an electric railway between Akron and the chain of lakes south of the city, is said to have announced that the proposition has been abandoned and that the bonds for financing the property will be cancelled. Money paid for bonds and stock will be refunded and deeds given for lots as premiums with stock will be taken up. [E. R. J., Feb. 13, '09.]

Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio.—Arrangements are said to have been completed by this company to extend its line from Bowling Green to Tontogany, 6 miles. The line already connects with the Lake Shore Electric Railway at Woodville, and at Tontogany it would connect with the Ohio Electric Railway lines. [E. R. J., Jan. 6, '09.]

Toledo, Fostoria & Findlay Railway, Fostoria, Ohio.—James McCampbell, president of the Board of Trade at Marysville, Ohio, has appointed L. B. Harvey, George E. Whitney and John H. Shearer to confer with the officers of this company regarding a route through that place for the proposed extension from Findlay to Columbus. Three routes are receiving consideration. One of them is from Findlay to Marion and thence to Columbus, and another from Findlay to Kenton and to Columbus, through Marysville, Mt. Victory, Byhalia, Plain City and other towns. The third is through Kenton, Richwood and several smaller places.

Toronto Suburban Railway, Toronto Junction, Ont.—This company was recently given a new lease by the railway committee. It is stated that the company proposes to

continue its line at present built to Weston, up to Brampton and along through Peel, Wentworth, and Welland Counties to Port Colborne. It also proposes to continue its line at present built as far as Lambton Mills along to Hamilton and on through Wentworth and Lincoln Counties to Niagara Falls. It was decided to give the company two years in which to start and five to finish the work.

Dunnville, Wellandport & Beamsville Electric Railway, Wellandport, Ont.—This company, which proposes to build a 22-mile electric railway to connect the three cities in the title, has advertised for tenders for the grading of the line. It is proposed to begin work at once. Three or four small bridges will be built, the largest to span the Chippewa Creek, and one over the Twenty River. The grade down the mountain is a comparatively easy one, being on an average about 3 per cent. Along the whole route the fills will be insignificant, the heaviest being between St. Ann's and Dunnville. It has been decided to purchase power to operate the line. James A. Ross, Wellandport, president. [E. R. J., Jan. 6, '09.]

Eugene-Pacific Electric Railway, Eugene, Ore.—George M. Miller writes that this company has been formed for the purpose of constructing an electric railway from Eugene to Florence. Surveys are now under way and the engineer's report has been placed in the hands of capitalists for examination. Plans are being made for developing water-power to generate current. A site has not yet been secured for the proposed power plant. All the stock in the Eugene-Pacific Electric Railway is owned by the Lane County Asset Company. Capital stock authorized, \$3,000,000. Officers: Frank E. Dunn, president; F. J. Berger, vice-president; J. W. Zimmerman, secretary; Alton Hampton, treasurer; Lohman & Company, San Francisco, Cal., engineers. [E. R. J., March 6, '09.]

***York, Pa.**—Dr. J. M. Wilson, George J. Fringer, William Benson, W. H. Bright and Stephen Gill are reported to be at the head of a movement to build an electric railway from Reisterstown to Hanover, 18 miles. The line will be a connecting link uniting Baltimore and York.

Memphis, Covington & Northern Railway, Covington, Tenn.—R. W. Sanford advises that this company contemplates building an electric railway to connect Memphis, Millington, Mumford and Covington. No definite arrangements have yet been made in regard to the furnishing of power. Officers: G. B. Gillespie, Covington, president; J. B. Witherington, Mumford, vice-president; J. T. Garner, Covington, secretary-treasurer. [S. R. J., Feb. 29, '08.]

Portland, Baker City & Butte Electric Railroad, Portland, Ore.—This company announces that its proposed electric railway will start from Portland and cross the Warm Spring Indian reservation and Central Oregon to Baker City, thence to Butte, Mont., a distance of 600 miles. Permission to survey across the reservation has been obtained from the Department of the Interior, and the survey will be immediately started. The company has also secured valuable terminal facilities and rights of way. It is the intention to start construction work about July 1. An 8000-hp steam power plant will be built at Portland and additional power will be purchased from the Wasco County Electric & Water Power Company, whose plant is located on the Deschutes River. The first meeting of the incorporators of the company was held on April 15, when the organization was completed. The following officers were elected: H. C. McAllister, president; J. W. Gilkyson, vice-president; John Tait, treasurer; J. C. Robinson, secretary; M. W. Gill, assistant secretary; C. D. Charles, general manager. The entire capital stock (\$2,000,000) was fully subscribed for and fully paid up. A bond issue of \$40,000,000 25-year 5 per cent gold bonds was authorized by the directors and ratified by the stockholders. [E. R. J., Feb. 13, '09.]

Laurens, S. C.—Joseph E. Sitrine, of Greenville, has been awarded contract to make surveys of the proposed electric railway between Laurens and Clinton. A. C. Todd, Laurens, is interested in the project. [E. R. J., April 17, '09.]

***Toppenish, Wash.**—Press reports state that F. A. Williams, Toppenish, and Otto Lube are considering a plan to build an electric railway from Toppenish to Zillah and back to Toppenish via Wapato.

Fairmount & Clarksburg Traction Company, Fairmount, W. Va.—This company has awarded to Hamilton & Huffman the contract for the grading of its line from East Park to the fair grounds.

Milwaukee Western Electric Railway, Milwaukee, Wis.—This company has recently awarded a contract to W. D. Chapman, Akron, Ohio, for the financing and building of its proposed 65-mile electric railway. Most of the right of way and franchises have already been secured. The line

will connect the following cities: Milwaukee, Sussex, Templeton, North Lake, Neosha, Hustisford, Juneau and Beaver Dam. A branch line will extend from Sussex to Wawhesha via Pewaukee. Headquarters, 914 Majestic Building, Milwaukee. J. W. Barber, 2829 Highland Building, Milwaukee, secretary. [E. R. J., March 27, '09.]

Salt Lake & Ogden Railway, Salt Lake City, Utah.—This company has purchased through H. A. Strauss, consulting engineer, Chicago, the following additional equipment and construction materials to be used in the electrification of its 35-mile standard steam road between Salt Lake City and Ogden, Utah: 10 car bodies, to be built by the Jewett Car Company; Baldwin all-steel M.C.B. trucks with cast steel full-swing bolsters; 36-in. Standard rolled steel wheels; overhead material to equip 37 miles of line from the Westinghouse Electric & Manufacturing Company. The trolley wire will be span-supported, designed for 700 volts d. c. operation; Westinghouse line lightning arresters; pole hardware from the Western Electric Company, Chicago, and the St. Louis Malleable Castings Company; 2000 guy anchors from the St. Louis Malleable Castings Company. All poles on the line will be back guyed, and this will require the purchase of approximately 3000 additional guy anchors. Negotiations are now under way for the purchase of interpole motors, automatic air brakes, etc., for the car equipments, and generator and substation machinery. A preliminary announcement of the electrification of the Salt Lake & Ogden Railway was presented in the *ELECTRIC RAILWAY JOURNAL* for Feb. 13, 1909, page 285.

SHOPS AND BUILDINGS

Rockland, South Thomaston & Owl's Head Railway, Rockland, Maine.—It is reported that this company is planning to build a new car house either at Crescent Beach or Martin's Corner. The building will be 35 ft. x 60 ft. in size.

Duluth Street Railway, Duluth, Minn.—It is stated that this company is planning to erect a water tower and sprinkling system at its car house on Fourth Street and Ogden Avenue, Superior, Wis.

Gallatin Valley Electric Railway, Bozeman, Mont.—This company, which proposes to construct an electric railway from Bozeman to Salesville, advises that it expects to award contracts within the next three weeks for the construction of a car house. Charles B. Anderson, secretary.

Grand Forks (N. D.) Street Railway.—Thos. D. Campbell, general manager, announces that this company will build a new car house.

POWER HOUSES AND SUBSTATIONS

Illinois Traction System, Peoria, Ill.—This company is said to have awarded a contract to J. J. Jobst for the construction of a new substation at Mackinaw. Plans are now being made to rebuild the substation at Minier.

Gallatin Valley Electric Railway, Bozeman, Mont.—This company advises that it is considering the purchase of machinery for two substations.

Camden & Trenton Railway, Camden, N. J.—This company advises that it is having plans prepared by Ford, Bacon & Davis, New York, for the erection of a new central power plant. At present power is being purchased from the Bordentown Light & Motor Company and the Cinnaminson Electric Light, Power & Heating Company. Pending the construction of the new plant, power will be obtained from the original source of supply or from the Public Service Corporation. If this latter company supplies it, two substations will be equipped on flat cars and located along the line.

Grand Forks (N. D.) Street Railway.—This company is considering the purchase of a 250-kw generator, Thos. D. Campbell, general manager.

Johnstown & Gallitzin Street Railway, Johnstown, Pa.—It is stated that this company, which proposes to construct an electric railway from Johnstown to Gallitzin, has determined to locate its power plant at St. Michael. [E. R. J., Feb. 6, '09.]

Galveston-Houston Railway, Houston, Tex.—This company, which proposes to build an electric railway between Galveston and Houston, is said to be contemplating the erection of a power plant at some point between the two points. The proposed plant will probably have a capacity of 2000 kw. Plans have not yet been prepared. [E. R. J., March 13, '09.]

Houston (Tex.) Electric Company.—It is reported that this company will expend \$150,000 for improvements to its power station, which will include the installation of an 800-kw unit, with two 500-hp boilers and two new stacks.

Manufactures & Supplies

ROLLING STOCK

Topeka (Kan.) Railway will purchase 10 city cars through L. E. Meyers, Chicago, Ill.

Fort Wayne & Wabash Traction Company, Fort Wayne, Ind., is in the market for 10 city cars.

Gallatin Valley Electric Railway, Bozeman, Mont., will purchase one 360-hp freight locomotive and one 160-hp passenger motor car.

Pittsburg & Kansas City Railway, Pittsburg, Kan., is reported to be making inquiry as to the cost of interurban cars. This is a proposed railway.

Slate Belt Electric Street Railway, Pen Argyl, Pa., contemplates purchasing some additional rolling stock, though the number of cars has not been decided upon.

Nebraska Traction & Power Company, Omaha, Neb., has purchased two passenger and 10 freight cars through the General Construction Company, Omaha.

Northern Texas Traction Company, Fort Worth, Tex., it is reported, is in the market for 10 double-truck cars. Stone & Webster, Boston, Mass., are general managers.

Grand Forks (N. D.) Street Railway is having three cars built by the American Car Company. In addition, the company contemplates purchasing four double-truck second-hand trail cars and some good second-hand motor cars.

Little Rock Railway & Electric Company, Little Rock, Ark., which was reported in the ELECTRIC RAILWAY JOURNAL of April 3, 1909, as being in the market for 11 double-truck trailer cars, has decided not to purchase the cars now.

Portland Railway, Light & Power Company, Portland, Ore., recently received 30 pay-as-you-enter cars from the American Car Company, which are now in service on its lines. The company has ordered an additional 50 cars of the same type.

Kanauga Traction Company, Gallipolis, Ohio, mentioned in the ELECTRIC RAILWAY JOURNAL of May 1, 1909, as having ordered one car from the Jewett Car Company, Newark, Ohio, has only purchased material for the rebuilding of one car body recently destroyed by fire.

Cairo Electric & Traction Company, Cairo, Ill., mentioned in the ELECTRIC RAILWAY JOURNAL of April 17, 1909, as having purchased six 10-bench single-truck open cars from the American Car Company, it is learned, will have these cars built by the Danville Car Company.

Salt Lake & Ogden Railroad, Salt Lake City, Utah, has placed an order with the Baldwin Locomotive Works for the 20 Class 78-30 trucks to be used on the 10 interurban cars which have been ordered from the Jewett Car Company, Newark, Ohio, as reported in the ELECTRIC RAILWAY JOURNAL of May 1, 1909.

People's Railway, New Hamburg, Ont., a proposed road, contemplates purchasing ten 50-ft. combination cars with baggage, smoking and passenger compartments, with four 75-hp single-phase motors and multiple-unit control; also one or more express cars built to be used as electric locomotives in case of an emergency, and one 65-ton electric locomotive to be equipped with four 100-hp motors.

Ocean Electric Railway, Far Rockaway, N. Y., mentioned in the ELECTRIC RAILWAY JOURNAL of May 1, 1909, as being in the market for four cars, it is learned has purchased six double-truck cars from the St. Louis Car Company. The cars will have 34-ft. bodies with steel channel underframes and the platforms will be 6 ft. long. St. Louis No. 47 trucks and the Birney prepayment platforms were specified.

Interborough Rapid Transit Company, New York, N. Y., is asking bids on 94 motor and 56 trailer cars for subway service with the option of increasing the order to 250 cars, and is also in the market for 60 motor and 40 trailer cars for the elevated lines, with the option of increasing the order to 200 cars. The subway cars will be duplicates of the last 50 purchased. They will have single cross seats so that center doors can be put in if necessary. The elevated rolling stock will be the same as the cars now in service.

Milwaukee Northern Railway, Cedarsburg, Wis., mentioned in the ELECTRIC RAILWAY JOURNAL of March 13, 1909, as contemplating the purchase of interurban cars, has ordered two combination interurbans from the Niles Car & Manufacturing Company, Niles, Ohio. The cars will be 50 ft. 4 in. long over all, 8 ft. 10 in. wide over all, will have body length of 40 ft. 2 in., over vestibule 49 ft. 2 in., a height of 9 ft. 4 in. from sill to trolley base, a 6-ft. 8-in. wheelbase, will weigh 28 tons and seat about 52. The interior finish will be of quartered oak, with bronze car trimmings. The

company has specified Van Dorn type H couplers, Pantasote curtain material, Peacock brakes, Crouse-Hinds arc headlights, Symington journal boxes, Lintern signals, Nichols-Lintern sanders, Hale & Kilburn No. 3 flush and Pantasote seats, Niles steps and National sash fixtures.

Atlantic & Suburban Traction Company, Pleasantville, N. J., which was mentioned in the ELECTRIC RAILWAY JOURNAL of April 10, 1909, as having purchased three double-truck cars from The J. G. Brill Company, has specified the cars to be of the closed vestibule type, with 30-ft. 8-in. bodies and a seating capacity of 44. Other details of interest are:

Air brakes.....National A-4	Headlights Imperial arc
Circuit breakers.....GE 12-B	Motors.....2 West. 101-B
Control systemK-28	SandersDumpit
Curtain fixturesCurtain	SeatsWinner
Supply Company	Trolley base.....U. S. No. 1
GongsDedenda	Trucks.....Brill 27 GE-1
Hand brakesBrill	Wheels...Lehigh Car Wheel
Heaters Consolidated	& Axle Company

Burlington (Vt.) Traction Company, mentioned in the ELECTRIC RAILWAY JOURNAL of March 20, 1909, as having ordered four cars from J. M. Jones' Sons' Company, will have these cars delivered some time in May. The specifications include the following:

Type of car...13-bench open	Bolsters, body....Composite
Seating capacity.....78	Curtain fixtures.
Weight (car body only),	Curtain S. Co.
30,000 lb.	Fenders Parmenter
Bolster centers, length..19 ft.	Headlights.....Star 12-in.
Length of body...35 ft. 4 in.	Motors.....2-101-B West.
Over posts at belt.....9 ft.	Paint Masury
Sill to trolley base..9 ft. 1 in.	Registers.....New Haven
Height from top of rail to	Sanders.....De Witt
sills31¾ in.	Trolley retrievers....Wilson
BodyComb.	Trolley base.....Nuttall
UnderframeComb.	TrucksTaylor
Air brakes.....West.	VarnishBabcock

Northern Ohio Traction & Light Company, Akron, Ohio, which was reported in the ELECTRIC RAILWAY JOURNAL of April 24 as not having purchased a private car for Henry A. Everett from the G. C. Kuhlman Car Company, it is learned has ordered a car from the Niles Car & Manufacturing Company, Niles, Ohio, to replace the car "Josephine" recently destroyed by fire. The new car will be 53 ft. long over all, 8 ft. 9 in. wide over all, 9 ft. 5 in. high from sill to trolley base and will seat about 25. The body weight is 56,000 lb. The car will be fitted with kitchen, lavatory and toilet and a standard Pullman drawing room with upper and lower berths. The floor will be laid with rubber tiling and the interior finish will be mahogany. Other specifications are as follows:

Body Wood	HeadlightsCrouse-Hinds
Underframe.Niles semi-steel	Journal boxes....Symington
Center bearings..Symington	Lavatory fittings....Pullman
Control system,	MotorsGE-73
GE Multiple-Unit	SandersNichols-Lintern
Couplers.....Janney radial	Sash fixtures..O. M. Edwards
Curtain material...Pantasote	Trolley retrievers...Knutson
Gongs Niles	Trucks.....Baldwin Special
Handbrakes Niles	

TRADE NOTES

Putnam A. Bates, New York, N. Y., has removed from 42 Broadway to 2 Rector Street, where he has more commodious offices.

Allis-Chalmers Company, Milwaukee, Wis., has removed its Los Angeles office from 623 Citizens' National Bank Building, to 129 East Fifth Street.

Detroit Graphite Company, Detroit, Mich., has moved its New York office from 141 Broadway to 135 Broadway, where it will have more spacious quarters.

W. A. Campbell has been appointed sales manager of the General Railway Equipment Company of Chicago, recently organized. Mr. Campbell was formerly connected with the Hicks Locomotive & Car Works.

Edward M. Raymond, Real Estate Trust Building, Philadelphia, Pa., has been engaged for the last six months in examining and reporting on various electric railways and steam railroads on the Pacific Coast for investors.

Electric Service Supplies Company, Philadelphia, Pa., recently received an order from the Philadelphia Rapid Transit Company for sufficient automotoneers to equip all this company's cars.

Crocker-Wheeler Company, Ampere, N. J., has placed Edmund Lang in charge of its repair shop. For the last five years Mr. Lang has been connected with the Wheeler Condenser & Engineering Company.

T. H. Symington Company, Baltimore, Md., advises that Symington journal boxes and bearings were specified for use on the cars recently purchased by Stone & Webster, Boston, Mass., for the Galveston Electric Company.

Independent Pneumatic Tool Company, Chicago, Ill., manufacturer of "Thor" specialties, has removed its headquarters in the First National Bank Building, Chicago, to the company's new building at 1307 Michigan Avenue, Chicago.

Muralt & Company, New York, N. Y., have opened a branch office in the Temple Court Building, corner of Bay and Richmond Streets, Toronto, Ont. J. Engh, who has been connected with this company for many years, will be in charge as manager.

Western Electric Company, Chicago, Ill., will have ready for distribution at an early date a catalog of nearly 400 pages on its electric railway and mine supplies. It will be published in sections so that it can be distributed either in parts or as a complete publication.

Aldon Company, Chicago, Ill., has moved its main office from 631 Monadnock Block to room 964 in the same building. This company manufactures rail benders, car replacers and car movers, track drills and other railway supplies. E. W. Rosenberg is president.

Rooke Automatic Register Company, Providence, R. I., now has its registers in use by street railway companies in the following cities in Iowa: Des Moines, Sioux City, Okaloosa and Keokuk. The Waterloo, Cedar Falls & Northern Railway Company is also using the Rooke register.

Raymond Concrete Pile Company, New York and Chicago, has been awarded the contract for the foundations, including concrete piling, for the new six-story warehouse to be erected on Pier 2, Baltimore, Md., for the Standard Oil Company. Haskell & Barnes, Baltimore, are the architects for the work, and William Ferguson & Brother, the general contractors.

Walter B. Snow, Boston, Mass., announces the association with his publicity staff of Carl S. Dow, S. B., engineering department, Harvard University, late publicity manager, B. F. Sturtevant Company. Mr. Dow was also formerly in charge of the instruction and textbook departments, American School of Correspondence, and brings to the organization a diversified experience which will add materially to the value of the service rendered in all lines of technical publicity.

Keystone Lubricating Company, Philadelphia, Pa., manufacturer of Keystone grease, gives a record of this product as used in the Queens County pumping station at Valley Stream, Long Island, N. Y. This station contains two 8,000,000-gal. vertical triple-expansion pumping engines, built by William Todd & Company, Youngstown, Ohio. It is asserted that a saving of between 80 and 85 per cent is made over lubricating oil formerly used, with no increase in the friction load. This saving is based on an allowance for the oil that was filtered and reclaimed.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., announces that it has received a contract from the Falkenau Electrical Construction Company of Chicago, engineers for the Salt Lake & Ogden Railway Company, covering direct suspension line material for the 37 miles of electrification of the present steam road between Salt Lake City and Ogden. In the same connection, a contract has been closed covering the line material for the Gallatin Valley Electric Railway Company, of Bozeman, Mont., for 18 miles of new line; and an order has also been entered from the Long Island Railroad, covering 12 miles of low-voltage catenary construction.

Dossert & Company, New York, N. Y., report that H. B. Logan, their president, who is making an extended trip throughout the West, has concluded arrangements with Otis & Squires, 155 New Montgomery Street, San Francisco, Cal., to act as Pacific Coast managers for Dossert & Company. This firm will carry in stock a complete line of Dossert solderless connectors, cable taps and terminals. The company received during the current week large orders for its solderless cable taps and connectors from the Chicago City Railway, Worcester Consolidated Street Railway, St. Louis & San Francisco Railroad, South Side Elevated Railroad of Chicago and from the Copper Range Railroad and Southern Pacific Company.

Westinghouse Machine Company, East Pittsburgh, Pa., has lately received an order from the City Electric Company, of San Francisco, for a 15,000-hp steam turbine. This will be the most powerful steam turbine installed west of the Mississippi River. This company has already installed three Westinghouse steam turbines of a smaller size. The East Pittsburgh shops are also turning out for the city of Detroit a 5000-hp steam turbine, and another of

the same size is building for the Nichols Copper Company, of Laurel Hill, N. Y., while the Saginaw & Flint Railway has contracted for a 1150-hp turbine and the Alaska Treadwell Gold Mining Company, San Francisco, has ordered two 1000-hp units.

Railway Business Association, New York, N. Y., following out its publicity campaign and better to acquaint the public with the needs of railroad companies, has reprinted an article which appeared in a recent issue of *Machinery News*. This article discusses the new spirit which animates railroad management and contains recent interviews with E. H. Harriman, T. P. Shontz, W. C. Brown, Charles S. Mellen and other prominent railroad presidents. The interviews indicate that the railroad companies are anxious to deserve public approval, and the wide publicity given by the Railway Business Association in matters of this kind and the able speeches by the president of the association, George A. Post, and other officers, are doing a great deal to conserve the interests of the railway companies.

Henry Docker Jackson, consulting engineer, 88 Broad Street, Boston, Mass., visited the works of the Westinghouse Electric & Manufacturing Company at Pittsburgh, recently, to make an acceptance test on a special 250-hp motor, which is to be used to operate a ventilating fan in a coal mine in West Virginia. This is one of the largest electrically operated ventilating fans in the country. The motor is a specially designed one, the general scheme being suggested by Mr. Jackson, the design and details being worked out by the Westinghouse Company—the idea being to get the starting characteristics of the best type induction motor, combined with the operating and line regulating characteristics of the synchronous motor. The tests were eminently successful, both the starting characteristics and the regulating characteristics being remarkably good. The motor and fan are being installed in connection with other work at the mine, the consulting engineers on which are Messrs. Jackson and Timothy W. Sprague, who make a specialty of equipping mines with electrical apparatus.

ADVERTISING LITERATURE

Midvale Steel Company, Philadelphia, Pa., has published a catalog of mining wearing parts and smelter castings.

F. Bissell Company, Toledo, Ohio, has issued a small placard illustrating and describing its Security pole seat No. 2.

Carnegie Steel Company, Pittsburg, Pa., has reprinted the catalog on sheet steel piling made by it which was originally published in October, 1907.

Hobart Allfree Company, Chicago, Ill., has issued a pamphlet describing the Freeland clamp derailer and the Smyth handthrow derailer. These derailers are made in various sizes from 24 in. to 60 in. long.

John C. Dolph Company, Long Island City, N. Y., is distributing a series of catalogs with price lists of its insulation varnishes and compounds. These publications are being issued in English, French, German, Italian and Spanish.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has recently issued bulletin No. 82, listing second-hand railway material for sale, among which are rails, frogs, switches and other track material, locomotives and rolling stock of all types, and other railway supplies.

Samson Cordage Works, Boston, Mass., have issued a novel souvenir commemorative of the completion of 25 years in the manufacture of braided cord. It is in the form of a medal, the obverse of which shows Samson tearing apart the jaws of a lion and the reverse, a piece of braided cord.

Browning Engineering Company, Cleveland, Ohio, has printed the following descriptive bulletins: Lifting magnets, including locomotive cranes equipped with magnets; revolving steam shovels, orange-peel and clam-shell buckets for handling various materials, locomotive cranes, railroad ditchers and scraper bucket excavators.

Northwestern Expanded Metal Company, Chicago, Ill., is distributing a booklet on beam and column data prepared by its chief engineer, Ernest McCullough. Mr. McCullough is well known as a contractor, engineer and author on reinforced concrete. The booklet is intended to be eminently practical and free from complicated formulas.

Galena Signal Oil Company, Franklin, Pa., has printed in pamphlet form for distribution at the coming Master Car Builders' convention an extract from the argument of John G. Milburn in the suit of the Government against the Standard Oil Company, in which Mr. Milburn pays a high tribute to the genius of General Charles Miller, president of the Galena Signal Oil Company in building up the very large business which the company now enjoys.