Electric Railway Journal

A CONSOLIDATION OF

Street Railway Journal and Electric Railway Review

VOL. XXXIII. NEW YORK, SATURDAY, JUNE 26, 1909 No. 26

PUBLISHED EVERY SATURDAY BY THE

McGraw Publishing Company

James H. McGraw, President. J. M. Wakeman, 1st Vice-president.
A. E. Clifford, 2d Vice-president. C. E. Whittlesey, Sec. and Treas.

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NEW YORK, 239 WEST THIRTY-NINTH STREET.

CHICAGO: Old Colony Building.
PHILADELPHIA: Real Estate Trust Building.
CLEVELAND: Schofield Building.
LONDON: Hastings House, Norfolk St., Strand.

Cable Address, Stryjourn, New York; Stryjourn, London—Lieber's Code.
Entered at the New York Post Office as Second Class Mail Matter.

TERMS OF SUBSCRIPTION

United States, Hawaii, Puerto Rico, Philippines, Cuba, Mexico and Canal Zone.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also special daily convention issues published from time to time in New York City or elsewhere), postage prepaid..$3.00 per annum

Single copies.....10 cents

Combination Rate, in connection with American Street Railway Investments (The "Red Book"—Published annually in May; regular price, $5.00 per copy).....$6.50 per annum

CANADA: extra postage.....$1.50 per annum

To All Countries Other Than Those Mentioned Above.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also daily editions as above), postage prepaid.....$6.00 per annum
25 shillings. 25 marks. 31 francs.

Single copies.....20 cents

Foreign subscribers may remit through our London office.

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

The San Francisco Situation

The announcement that the jury in the Calhoun trial has disagreed, 10 being in favor of acquittal and only two in favor of conviction, undoubtedly marks the end of the remarkable attempt to convict the president of the United Railroads of San Francisco of bribery. We do not believe that the citizens of that city will stand for another trial. Indeed, it has been difficult for the residents of other cities to understand why the prosecution of Mr. Calhoun should have been carried so far or conducted with what has seemed to be so vindictive a spirit. Even if one believes, as evidently five-sixths of the jury did not, that the company had been mulcted by the city authorities for the privilege of rehabilitating its railway system after the fire and installing a trolley system, no other step did so much to facilitate the reconstruction of the city and bring order out of chaos. To have made an attempt to reconstruct the old cable system would have been little short of a crime, and would certainly have set back the improvement of the city for years. One fact, at least, has been demonstrated. By the attitude which Mr. Calhoun took during the subsequent long strike on his road he did more than any one else to free the city from the domination of unscrupulous labor leaders who had inflicted more damage to the city than the earthquake and fire combined.

The Master Mechanics' and Master Car Builders' Conventions

The convention of the American Railway Master Mechanics' Association, which was held last week at Atlantic City, and the convention of the Master Car Builders' Association, which followed it this week, attracted an unusually large attendance of steam railway officers. The program of the two conventions, while up to the high standard of previous years, included only a few subjects of special interest to electric railways. The most important of these was that relating to the height of the standard car-wheel flanges, a proposal which is discussed in its relation to electric railway work on the next page. So far as hotel accommodations and exhibit space were concerned, the convention was a success and confirms the deserved popularity of Atlantic City as a place for holding large gatherings of this kind. As usual, there were no afternoon sessions, a condition which contrasts strangely with that at electric railway conventions, where meetings last frequently until 5 o'clock or 6 o'clock in the afternoon, and evening sessions are not unknown. Nevertheless, the steam railroad convention schedule has its advantages, not the least of which is that it allows ample time to inspect the exhibits.

Keeping Interurban Cars Clean

Every interurban railway manager is face to face with the difficult problem of keeping his cars reasonably clean. The motto, "No dust, no dirt, no cinders," loses its value to electric roads as a promotion of traffic argument if the cars are poorly ventilated and unclean inside. A company can have its cars swept out and disinfected at terminals, and give them at regular intervals a thorough cleaning from roof to floor, but the co-operation of the traveling public is necessary to prevent them from getting objectionably dirty during the course of a single trip. Dr. Hurty,

secretary of the Indiana Health Board, at the recent conference of State and provincial boards of health, suggested that trainmen be supplied with cards or advertising leaflets appealing to the public to help keep the cars clean. This is an excellent idea which might be utilized in many ways. The Third Avenue Railroad, New York, has signs prominently displayed in all its cars reading, "Help us to keep this car clean." The backs of cash fare receipts and of transfers might also be used for making such an appeal. It is thoughtlessness, rather than malice, which prompts most passengers to throw papers, peanut shells and tobacco on the floor or to put their feet upon the seats, and a gentle reminder to passengers to avoid soiling the seats and littering the floor with refuse would undoubtedly prevent the accumulation of much of the objectionable dirt. During rainy weather rural passengers boarding the cars at crossroads carry in mud, which is soon ground into the floor and rises in a fine dust, covering the seats and woodwork. At a small expense clean gravel platforms could be built at crossroads stops, and foot scrapers could be attached to one of the retaining planks. Mired-up passengers would appreciate such conveniences and the platforms would assist in reducing boarding and alighting accidents. The practice of carrying section-men with their tools on regular passenger cars is not conducive to cleanliness, and for the comfort of other passengers ought to be regulated or prohibited.

Reduction of the Height of Car Wheel Flanges

The report of the standing committee on car wheels of the Master Car Builders' Association this year includes one recommendation which is of special interest to electric railway companies. It suggests that the height of flange of new cast-iron, steel-tired or solid steel wheels be reduced from 1⅛ in. to 1 in. by rounding off the tip of the flange on a radius of ⅝ in., beginning at the gage line ⅝ in. beyond the base line. The contour of the flange and tread inside of the gage line is not altered by the proposed change. The committee bases its recommendation principally on the possibility of obtaining a much greater mileage out of wheels with the short flange before they are condemned for worn treads under the present limit of wear allowed by the standard wheel defect gage. It will be possible to increase the allowable limit of tread wear nearly 50 per cent, and correspondingly increase the amount of flange wear, before the danger point is reached. Short flange wheels, even when considerably worn on the tread, will clear the filling blocks in frogs and built-up crossings and ride the rail head instead of the flange groove in solid manganese special work.

The proposed change is of interest to officers of electric railways for two reasons. The first is because it affords further proof of the fact that it is not absolutely necessary to have deep flanges on wheels to enable them to run safely at high speed. A second reason is that freight cars equipped with 1-in. flange wheels could be accepted from steam railways in interchange and run over shallower rails and special work in paved streets, without danger from derailment due to running on the flanges, than would otherwise be the case. The committee in its report says: "A change in the height of the flange can be made consistently when it is shown that the original angle of the flange to resist derailment is in no wise changed." Farther on it reiterates that "the change is entirely safe." We believe that it still remains to be proved that a single derailment of a car equipped with wheels having a ⅞-in. flange has been caused solely by insufficient bearing on the side of the rail. Any defect of track which will cause a wheel to climb ¾ in. or more on the rail will produce a derailment as quickly and surely with 1⅛ in. high flanges as with ⅞-in. or 1-in. flanges.

A Readjustment of Interurban Fares

A readjustment of interurban passenger fares on the system of the Indiana Union Traction Company became effective on June 10, and is renewed evidence of the widespread consideration of the question of fares which time has revealed was necessary for the electric railways in various parts of the country. A number of important changes, affecting both traffic and revenue, have been made at the same time by this company, which operates one of the most extensive systems in the important Central Electric territory. These include the abolition of the zone system of collecting fares, the abandonment of excess fares on limited cars except in a few instances, and the withdrawal of all mileage books except the 1000-mile, interchangeable Central Electric Traffic Association ticket. A monthly commutation book at a flat rate of 1¼ cents a mile will be issued.

An official statement, issued on behalf of the company by H. A. Nicholl, the general manager, says that the effect of the readjustment in interurban fares will be to increase fares in some instances, to lower in others, and to make no change in still others. Where the changes will be an increase, they "will be slight and in no case more than sufficient to place the fares on a basis now believed to be commensurate with the cost of the service." Mr. Nicholl then adds what is so well understood by managers of electric railways, but still unappreciated by the general public so far as it affects public utilities operated by corporations, that the cost of the service "has been materially increased in recent years by the increased cost of practically every element entering into electric railroad operation, combined with the necessity of extensive renewals in track, overhead and rolling stock, and of expensive betterments and improvements in roadbed, equipment and service."

That increased cost is assuredly an element with which every one must reckon is apparent to every student of the tendencies of the times affecting public service corporations. If the argument is advanced that the railways should have foreseen the necessities of the situation more accurately than has proved to be the case, the answer may be made that if the traffic and revenue possibilities of many lines had not appeared much more rosy than will be justified by the facts for a number of years, scores of communities which have been developed in every material respect by the influence of electric railways, would still be without the desired rapid transit facilities which their citizens enjoy.

One important aspect of the action of this company is suggested by its reference to the intensified effect of increased costs resulting from the decline in earnings which

started in the autumn of 1907, due to "business depression and keen competition." It was at that time that the panic which was first apparent in the security markets and financial centers began to exert its unfortunate effects throughout the rest of the country. During the interval between that time and the present some companies, notably in Massachusetts, have established, with unquestioned success, higher fares in place of rates that were admittedly inadequate. Other companies have postponed the consummation of plans for similar changes, not because they believed it would be difficult to justify advances, but for the reason that they thought a period when prices generally were advancing would be more opportune for success and appreciation of the economic necessities under which the railways were acting. Since the depression is now of the past, and the present holds assurance of continued improvement in business with renewed advances in prices, it follows that increases in fares will be worked out in various instances.

The Maintenance of Motor Field Coils

In the work of maintaining electric railway motors the commutator naturally receives the largest share of attention, and there is not infrequently a tendency to neglect the condition of other parts as long as no trouble is encountered. The field coils, for example, are generally left to shift for themselves in the absence of an active fault. There is a widespread belief that when a field coil burns out or develops a ground it can be restored by some sort of impregnation treatment and readily reinsulated for future service. This is by no means the case. In one recent instance a record was kept of the number of field coils sent to the shop for repairs in a period of four months. There were 1781 coils received in this time, and 46 per cent were so far gone that scrapping was the only alternative. On a single type of motor of recent design it was found that only 20 per cent of the coils could be saved, so severe had been the roasting in service. If these coils could have been taken out of service a little earlier they could have been impregnated in many cases and saved by reinsulation, with a resulting economy in labor and material.

It is important for the best service of armatures that weakened field coils shall not be allowed to develop through short-circuited or grounded turns. The operation of a weak field is a powerful incentive to motor flashing and to overheating of the armature coils through the suppression of the counter e.m.f. as the turns pass the weakened pole face. Often an armature which has been overheated from this cause will look all right when examined, but when the insulation is disturbed it falls to pieces and crumbles easily, showing that inordinately high temperatures have been applied. Great care on the part of car inspectors is therefore desirable in the prevention of accumulating troubles due to weakened fields. At present there are one or two electrical methods of testing the strength of motor fields, but these are scarcely delicate enough to show the conditions unless the coil is too weak to stand being impregnated for future service. The most practical method of detecting weakened fields seems to be by sounding with a tap-hammer and a practiced ear can soon tell the presence of deteriorated insulation by the dry, brittle, dead or hollow sound which the coil yields when struck. It is noteworthy that insulation will sometimes undergo considerable mechanical disintegration before the electrical breakdown comes. When a motor fails or gives evidence of field coil trouble in service, it is sometimes injured by the neglect of the motorman to cut it out on the way back to the shop. The policy of holding in the circuit-breaker in a four-motor car with one motor out of order tends to overheat and roast out the defective machine, and too much care cannot be exercised to prevent the abuse of already crippled equipment. It is possible that if motor field coils were run upon a mileage basis, with rigid shop inspection and test at the end of each period, the cost of replacing fields might be considerably decreased.

Taxation of Profits

John Stuart Mill, in discussing the subject of taxation, states that where taxes are assessed upon the profits of capital there is an inevitable tendency to shift a part of the burden of taxation upon the consumer. Capital is bound to have its legitimate profit, which is fixed by the law of supply and demand, and if a certain percentage of the profit earned in any line of business must be paid to the Government the price charged to the consumer for the manufactured article must be increased to cover, or nearly cover, the tax. Other political economists have taken a similar view, and their position is a logical one when applied to most industries. Unfortunately, the theory does not hold in city railway transportation, or, in fact, with any public utility or other corporation whose charges are fixed either by agreements or ordinances. A manufacturer of shoes or machinery can raise his prices 1 per cent or more to counterbalance a charge of, say, 2 per cent upon his profits, and if all other manufacturers of shoes or machinery have to pay a similar tax he is not much worse off than he was before. But when any such tax is laid upon a street railway company it has to be paid directly out of the meagre return to the already overburdened investor. None of it can be recouped by raising the fare. Up to this time State and municipal taxes have been the only ones which railway companies have had to consider. These taxes have grown so rapidly that in the case of the railways in New York City they have doubled within the last 10 years. If, now, a supertax of 2 per cent is laid by the National Government, as suggested last week at Washington, it will amount practically to confiscation. The claim is made that this tax is a return for the absence of individual liability of the stockholders. But articles of incorporation are not granted by the National Government, but by the States, which have power to regulate the degree of liability of the stockholder, and practically every State has already assessed its corporations for this privilege by organization fees and special taxes. We believe that the public secures at least as much benefit as stockholders from the organization of companies, because without corporations it would be impossible to carry on enterprises of any magnitude. The theory that the limited liability of the stockholder is a privilege which must be paid for several times over is merely a polite excuse. Taxes are assessed on corporations because they can be more easily reached by the assessors and tax collectors than can individuals.

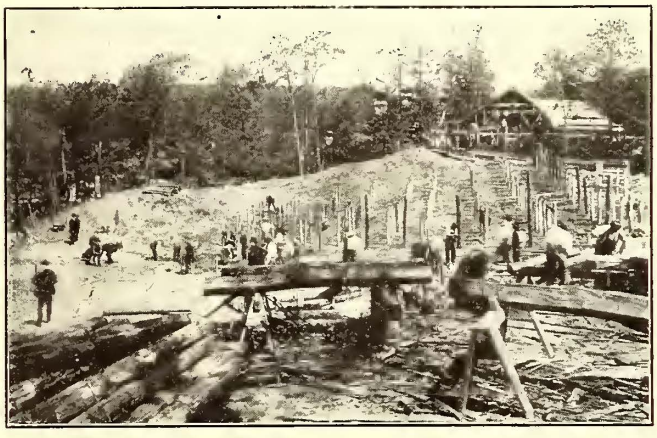
BUILDING A STREET RAILWAY PARK THEATER IN EIGHT DAYS

A record-breaking performance in the construction of a theater for street railway park service was recently accomplished at Norumbega Park, Auburndale, Mass., under the direction of Matthew C. Brush, vice-president and general manager of the properties controlled by the Boston Suburban Electric Companies. At 2 o'clock a. m., Friday, June 4, the large steel, open-air theater at the park was burned to the ground, and the management faced a loss in revenue of upward of $1,000 a day for each day that performances

Friday, June 4—Ruins of Norumbega Theater

were suspended. An immediate decision was made to rebuild, and the work was done in eight days, a total seating capacity being provided for over 3000, which is 150 more than in the structure destroyed. Although the new theater is to be replaced by a structure of reinforced concrete at the close of the present season, it is practically the equal of the previous structure throughout.

The fire originated in one of the dressing rooms adjoining the stage, and was discovered by the night watchman at 1:56 a. m. The Newton Fire Department was immediately summoned by an alarm from a private box at the

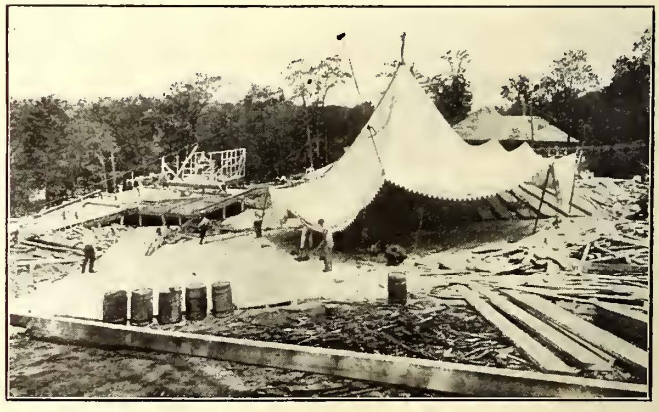


Sunday, June 6—First Timber Work Under Way

entrance of the park. General Manager Brush arrived at the scene at 2:20 a. m., Assistant General Manager Sylvester reaching the spot at about the same time. It was at once seen that the theater could not be saved, and immediately steps were taken to notify the Boston newspapers, insurance adjusters, the engineer who designed the structure, structural steel men, carpenters, contractors, the architect of the theater, and every available man connected with the railway organization, by telephone. At 4 a. m. G. H. Brazier, of J. R. Worcester, Boston, consulting engineer, arrived on the scene and outlined plans for meeting the situation from the standpoint of design. Within half an hour after the fire started steps were taken to prepare for the erection of a new structure. By 4:30 a. m. 75 men were on the ground ready to clear away the debris as soon as the ruins could be sufficiently cooled. These men were called from the track, line, car house and transportation

Tuesday, June 8—Preparing the Auditorium Floor

departments from all divisions. At 5 a. m. a number of carpenters and contractors arrived to figure on the cost of the new work in a rough way, and at 6 a. m. the approval of President James L. Richards to rebuild was secured. At 7 a. m. the first of the contractors' teams arrived to remove the wreckage, which is illustrated herewith, and which included a mass of twisted steel weighing about 100 tons. During the progress of the fire men were stationed at the cages of the wild animals housed in the park zoo, with rifles loaded, ready to meet any contingency. At 8 a. m. the insurance adjuster arrived, and at 9 a. m. a force of steel erectors reached the park, and went to work

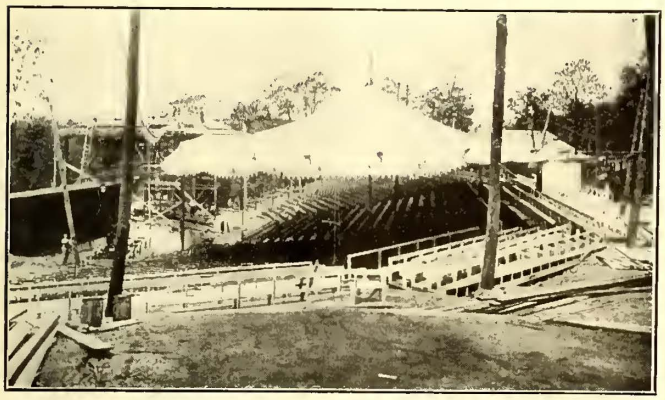


Thursday, June 10—Further Progress on Auditorium Floor

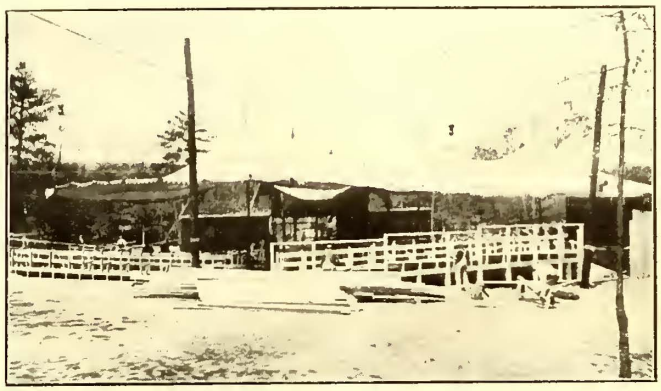
on the removal of the steel. The rivets were cut out by hand, but the steel members were removed by block and tackle connected with a donkey hoisting engine. At 10 a. m., Friday, the first load of lumber arrived at the park from the mill of the Buttrick Lumber Company, Waltham. By noon, Friday, dasher signs inviting the public to visit the ruins were placed on all cars of the Boston Elevated Railway Company and the Boston Suburban Electric Com-

panies, and a large sign was also placed on the ruined steel work, outside the park. On this day temporary electric lighting was installed to enable work to be done day and night at the site of the fire. This was handled by the line department of the railway.

Clearing of the ruins was continued on Saturday, June 5, and lines were run by the engineering force. Plans and specifications were drawn up and submitted to the contractors, and on Sunday, June 6, the contracts were awarded. Erection of the posts underneath the inclined floor of the auditorium was well under way Sunday. On Monday, June 7, regular construction under the contracts was initiated. It was decided to make the floors of the stage, property room, dressing rooms and auditorium permanent, leaving the superstructure temporary in character. In the main the plans of the previous theater were followed. This was fully described in the STREET RAILWAY JOURNAL of July 9, 1904. A photograph of the progress of the work was taken each day at 2 p. m.

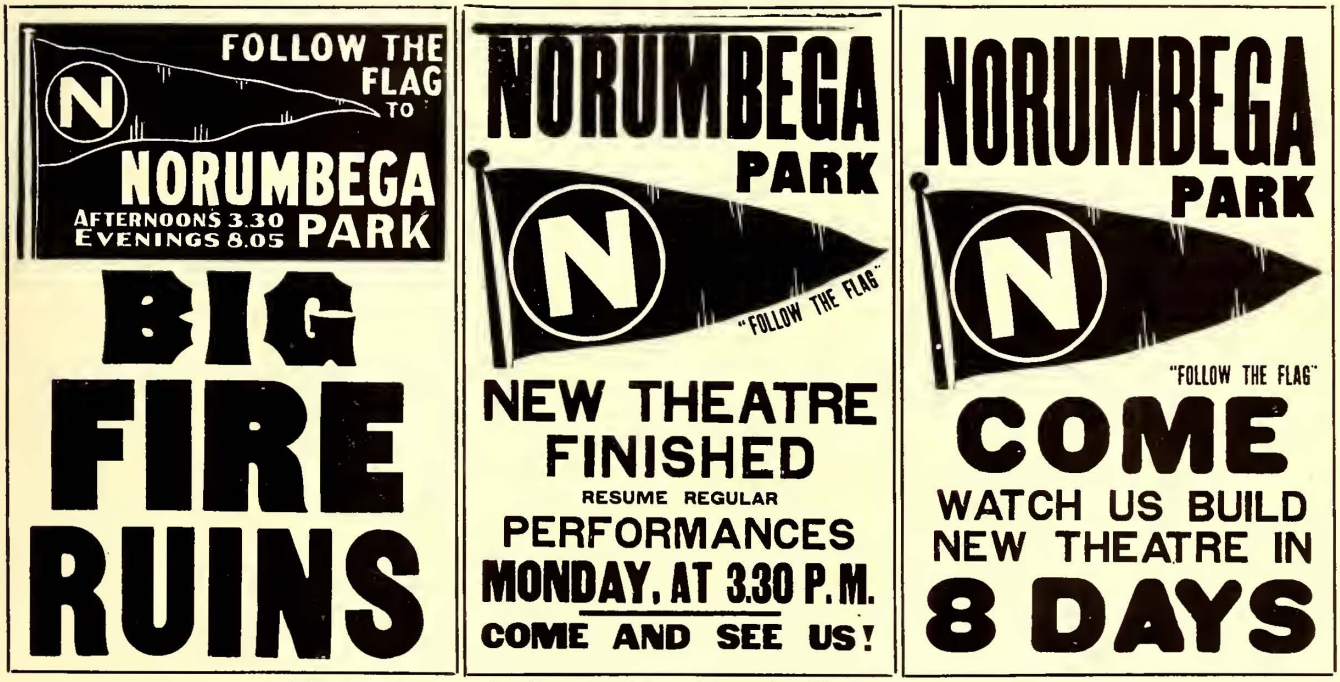


Saturday, June 12—Auditorium Nearly Completed



Monday, June 14—Ready to Amuse the Public

From Monday, June 7, to Saturday, June 12, all the cars of the Boston Elevated and Suburban systems carried posters asking the public to visit the park and see the road build a theater in eight days, and a large number of people took advantage of the opportunity. Mr. Brush promised the public that the theater would be opened for regular performances on Monday afternoon, June 14. On Monday, June 7, the foundations of the floor of the auditorium were practically completed and the floor boards laid in part. The women's rest pavilion, near the theater, had been damaged slightly by the fire, but this was nearly repaired by this date. The final running of lines for the stage was completed Monday. On Tuesday, June 8, the flooring of the auditorium was entirely covered in and the posts supporting the stage were built. On Wednesday, June 9, cross-bracing for the stage was undertaken and gin poles were erected for the placing and support of the roof covering, canvas being used for the latter. Thursday, June 10, the erection of the canvas roof was well under way, and the flooring of the stage rapidly pushed. The latter consisted of a 2-in. hardwood floor, laid on 3-in. spruce planking. The hardwood was oiled before use, as was the auditorium floor. The canvas was supported on three gin poles, 35 ft. long, of hard pine, with 10 shorter poles set at the sides for guying. The supporting of the stage required the setting of about 100 posts, while over 500 were needed for the floor timbers of the auditorium. On Friday, June 11, one week after the fire, the canvas roof was up; the seats were in place, 3000 having been brought from Somerville in a service car and trailer; the framing for the stage roof was under way, and the side and end walls of the dressing rooms were closed in. Saturday, June 12, and Sunday, June 13, the auditorium was cleaned up, and the final work done upon the stage and its surroundings. The theater was completed by Monday afternoon and ready for



Three 14-in. x 21-in. Posters Advertising the Fire as an Attraction

a performance, but the absence of an audience deferred the opening until the evening, when a large and enthusiastic attendance was present.

In the construction of the theater about 100,000 ft. of lumber were used. The heaviest timbers were the four corner posts supporting the theater stage roof, which is of wood. These were 40 ft. long and 12 in. square. The lumber was hauled to the park in automobile trucks. All sawing was done by hand on the grounds. The lighting supplies were brought from Boston, 10 miles distant, in a taxicab. The canvas was transported in a special car of the Boston Elevated Railway Company. Many of the supplies used were drawn from the storerooms of the Suburban lines. The night illumination was effected by 25 arc lamps supplied with current from the Homer Street power station. The stage is provided with lighting connections from the turbine power plant of the companies at Waltham, and is also connected with the Boston Edison service. All the wiring was inspected by the city authorities of Newton before it was used, and the plumbing was inspected practically as fast as it was completed. The day before the theater was completed, Sunday, June 13, posters were placed on the cars announcing that the work was finished, as promised. The inside of cars was also pressed into service for advertising. The work was handled by a total of 300 men, divided into two daily shifts of 18 hours each. The men were fed at the park restaurant. General Manager Brush was on the grounds and in touch with the telephone line practically every minute of the week. A special instrument was located at the site of the theater, and an operator provided to attend it. Shortly after the opening of the new theater, lantern slides showing the progress of its construction from day to day were prepared and exhibited in connection with the regular entertainment. It is the intention of the company to rebuild the superstructure in the fall, and employ reinforced concrete throughout, making the theater probably the largest and most complete fireproof open-air establishment of its kind in the world. Among the officials whose co-operation made the rapid building of the theater possible are General Manager Brush, who bore the immediate responsibility for the entire project; Assistant General Manager Sylvester; Carl Alberte, manager of Norumbega Park; George Hill, superintendent of wires; Thomas Demoy, foreman of tracks; Dan O'Connors, master painter; Samuel L. Brown, architect, Boston; G. H. Brazier, of J. R. Worcester, engineer, Boston; J. Hargedon, West Newton, contractor for staging and floor. The entire force of men worked with enthusiasm and loyalty to bring about the result attained. To date the cost of building the theater anew is about $13,000.

The Employees' Society of the Havana Electric Railway, with a membership of 919, helped its members with the following services during 1908: Cash paid to members on sick leave, $3,639; medicines, $1,766; surgical operations, $371; damages for accidents, $103; fines paid into correctional courts, $202; privileges during imprisonment, $8; funeral expenses, $48; bonds given to courts, $2,850. In addition to the foregoing, the society has taken a large number of the employees out of the hands of the usurers by loaning small sums of money to its members. These loans amounted to Feb. 1, 1909, to $7,324.85. Prior to the organization of the society, the borrowing of this amount would have cost the employees $1,464.87 a month interest, whereas at the present time the interest required by the society is $73.24 a month.

THE RECONSTRUCTION OF STREET CAR TRACKS IN CHICAGO*

BY GEORGE WESTON, MEMBER, BOARD OF SUPERVISING ENGINEERS

The principal object sought by the design of track construction adopted for the rehabilitation of the Chicago surface lines was permanency of construction with minimum maintenance, depreciation and renewal expense. Inasmuch as the rails and joints of a track are subject to direct and continuous wear and must in time be renewed, the track has been divided, possibly arbitrarily, into what we term a "superstructure" and a "substructure." That part of the track that must be renewed being styled the superstructure, consisting of rails, joints and possibly the tie fastenings; and that part of the track not subject to direct wear, or necessarily affected by the operation of renewing the superstructure, has been styled the substructure, consisting of ties, ballast, etc. Pavement is considered to be a separate item.

There has been developed and approved by the Board of Supervising Engineers three types of track, each type differing from the others in the character of the substructure and tie fastenings. These types are as follows:

Type 1 consists of a concrete foundation, with steel ties, spaced 4 ft. center to center, entirely embedded in concrete, and with a specially designed renewable clip and wedge for fastening the rail to the tie.

Type 2 consists of a concrete foundation with wood ties, spaced 4 ft. center to center, entirely embedded in concrete, and with tie plates and screw spikes for rail to tie fastening.

Type 2-A, same as Type 2, excepting that the ties are spaced 3 ft. center to center.

Type 3 consists of a rolled, broken stone foundation, with wood ties, spaced 3 ft. center to center, and with tie plates and screw spikes for rail to tie fastening.

The substructure in Type 1 track has the elements of permanent life, to wit: Steel ties embedded in Portland cement concrete. Steel embedded in concrete is protected from corrosion, and therefore permanent life can be expected from Type 1 foundation, if motion can be prevented between the tie and the concrete, which otherwise would tend to cause disintegration of the concrete and consequent failure of the foundation. While, with the use of steel ties, all members of the board were of the opinion that the resulting foundation containing the elements of permanency as regards materials, the question of rigidity of the track and the presence or absence of sufficient resilience or cushioning effect to absorb shock and vibration was discussed at length, with the final result that the use of wood ties in Type 2 or Type 2-A track meets with more favor, and today Type 2-A is practically the standard track adopted by the board.

It is only practicable to build track with a concrete foundation when conditions are such that traffic will not be put upon it for a sufficient length of time to permit the concrete to become properly set. This can be done when long stretches of track are to be built and provisions can be made for re-routing the cars, or the construction of a temporary track for their operation. Also, in the placing of special work, such as frogs and crossings, it is impracticable to attempt to use this type of foundation, and a concrete substructure should have a solid foundation of soil under it. Therefore it became necessary to design a type of track that could be used for emergency, special work, unimproved streets, etc., and Type 3 has been adopted for such uses.

The steel tie used in Type 1 track is an I-beam shape, weighing 14.5 lbs. per yard, with one wide flange and one narrow flange. The tie is inverted, with the wide flange up to receive the rail. The tie becomes a part of the permanent substructure and must be protected from wear, and must not necessarily be disturbed in the operation of renewing the rails. A tie plate and "clip" fastening were designed to accomplish this result. By the use of special fastenings, independent of the rail fastenings, the tie plate becomes a part of the tie; no movement can take place

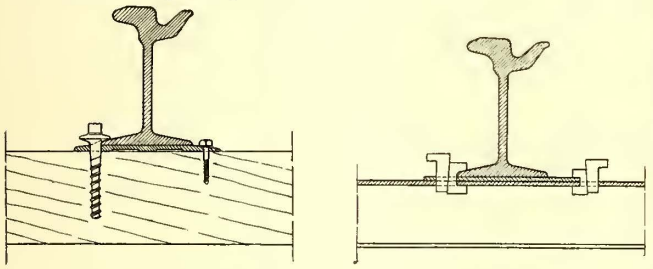
*Abstract of a paper read before the Western Society of Engineers, Chicago, June 16, 1909.

between the tie plate and the tie, thereby protecting the tie from wear. These tie plate fastenings are so designed that at the time the rail is renewed, the tie plate can also be renewed without disturbing the tie. The rail is fastened to the tie plate and tie by a clip that can be removed and replaced without disturbing the tie.

The wood tie used in Types 2, 2-A and 3 track is 6 in. x 8 in. x 7 ft. long, treated with chloride of zinc. It was believed that timber incased in concrete would be preserved against decay, and the first specification for the manufacture of ties called for untreated, 90 per cent heart, yellow pine ties. After further discussion, it was the unanimous opinion of the board that the treatment of the wood ties by a preservative would be an added insurance against their decay sufficient to warrant such additional expense that might be incurred by the use of treated ties.. For use in street railway track, where the ties are encased in concrete and protected from rains and floods, and no opportunity exists for the soluble salt to be "leached" out of the timber, chloride of zinc treatment was determined upon as sufficient to preserve the ties against decay. The specifications for treated ties include the following timbers: Long leaf yellow pine, short leaf yellow pine, loblolly pine, black gum, Norway pine, oregon fir, cypress or selected red oak.

The specifications require the treatment to be applied in retorts or cylinders properly arranged for steaming, vacuum and compression treatment. In the steaming treatment the temperature must not exceed 250 deg. Fahr., and the vacuum applied shall not be less than 26 in. of mercury, and the pressure used for impregnating the fluid shall not exceed 100 lb. per square inch. The solution must carry such percentage of chloride of zinc salt that the mean impregnation per cubic foot of timber shall be ½ lb. of pure chloride of zinc.

One of the principal causes for the failure of a concrete foundation track with wood ties has been caused by the failure to protect the tie from abrasion produced by movement of the rail. The rail having been spiked directly to the tie with ordinary hook-head spikes, the spikes pull out under traffic and permit a movement of the rail which destroys the fiber of the wood. In order to protect the tie thoroughly from the action of the rail, tie plates secured to the tie by "fetter drive" screws are being used; the plates thereby becoming a part of the tie. This tie plate can be renewed wherever the rail is renewed, without disturbing the tie if it is so desired. The rail is secured to the tie by screw spikes, which can be removed or replaced whenever it is desired to renew the rail without disturbing the tie.



Rail and Tie Plate Fastenings on Wood Tie and on Steel

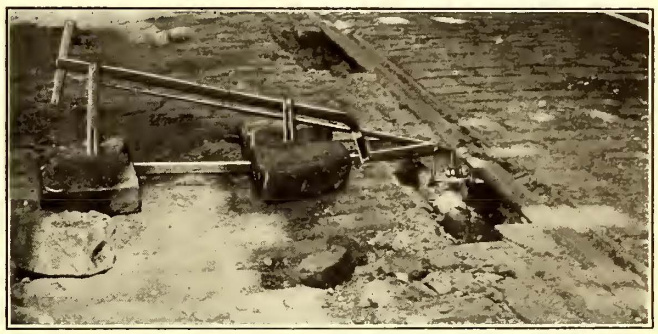
To assist in holding the rails to line and gage the tie plates are provided with a shoulder and tie rods, 5/16 in. x 2 in. with 1-in. round terminals, forged from solid bars, are used, spaced every 6 ft.

The rehabilitation ordinances, under which the Board of Supervising Engineers is working, provide under the head of "Bonding" that "There shall be some form of bonding used which shall connect the ends of the rails in such manner that the conductivity of the joints shall be equal to the carrying capacity of the rail." The Board of Supervising Engineers concluded that an electrically welded joint would fulfill the ordinance requirements as to conductivity, and with proper protection against possible breakages, the joint was considered to be an advantageous one to adopt. All of the straight track that has been built to date, under the ordinances, has been electrically welded at the joints.

On "special work" a bolted joint has been used, and in order to provide for the continuity of the full conductivity of the rails through the special work a copper cable is placed through the special work for each rail, with the ends of the cable welded to the web of the straight track rail outside of the special work. The joints of this special work are bonded with a small copper bond, to take care of what might be termed the "internal conductivity" of the piece of special work.

Careful study has been given the subject of track "special" work, and the very important point of providing passing clearances for cars operating in opposite directions on curves has been accomplished. In addition to "hardened center" work, specifications also provide for solid manganese switches, mates, frogs and crossings, and a large part of the special work that has been installed under the supervision of the board, particularly on trunk line, heavy traffic streets, has been of the solid manganese type.

The specifications covering the concrete work in the substructure have been drawn very carefully, and in prosecuting the work great care has been taken to have first-class materials and thorough workmanship in mixing and placing. The specifications provide that the concrete shall consist of "Portland cement, 1 part; sand, 3 parts, and crushed stone, 6 parts;" that the Portland cement shall conform to the "Standard specifications adopted by the American Society for Testing Materials;" "the stone shall be hard, durable and free from dirt, broken and screened and what is known commercially as 1-in. stone;" "the sand used shall be sharp, clean torpedo sand, free from dust, loam and dirt." The specifications cover mixing by hand for emergency, but the mixing of the concrete for the general work is done by machine under the following specification: "The constructor may use a machine mixer at the discretion of the engineer in charge. The necessary requirements for the machine will be that the precise and regular proportioning of materials can be controlled, and the product be of the required consistency when thoroughly mixed, and that, if the machine travels on the track rails, the vibrations and the strains due to moving the mixer will not be sufficient to affect the line and grade of the track." The specifications require that the track shall stand 14 days after the concrete has been placed before cars are allowed to be operated thereon.



Rail Deflectometer in Service

Where the pavement on the outside of the track is asphalt, or of similar character, that can be swept and cleaned, the stone and sand are deposited directly upon the clean pavement, but on unpaved streets, or where the pavement is of such character that it cannot be thoroughly cleaned prior to the depositing of the concrete materials, a floor of planking is laid upon the street to receive the concrete materials.

The spaces under the heads of the rails and next to the webs are filled with a Portland cement mortar, composed of one part Portland cement and three parts torpedo sand.

In order to provide a thoroughly solid foundation, the trench prepared to receive the track, after having been excavated to the required depth, is thoroughly rolled with a heavy steam roller, and all soft places that are thereby developed are excavated and properly filled with good, clean sand or gravel, rammed, rolled or puddled, as may be directed. In the case of Type 3 track, in addition to rolling the excavation, the crushed stone is thoroughly rolled before placing the ties to receive the track rails.

In designing the foundation for Types 1 and 2 track, with the ties 4 ft. center to center, it was figured that the

principal office of the tie would be to hold the rails down and to line and gage, and that the loads of passing cars would be distributed to the soil by the concrete. During the year 1907 all wood tie, concrete foundation track constructed was of Type 2 design, with ties 4 ft. center to center. During the winter of 1908 the track built during the previous year was carefully inspected to ascertain its behavior under traffic, and it was found in places that a slight movement in the rail could be detected under the load of passing cars. The chief engineer of the work directed that an investigation be made to ascertain the cause of the movement, to what extent it affected the track construction and what the possible results might be.

In order to make this study and determine the rigidity and action of the different types of track construction under traffic, observations were taken by means of a "deflectometer," designed especially for the purpose. This apparatus was so constructed that lateral movement of the rail could be observed as well as vertical deflection, and it was also arranged so that any vertical movement of the ties in the concrete could be readily determined and measured. The principal object of the investigation was to determine if any movement occurred of sufficient magnitude to disintegrate the concrete foundations or to endanger the life of the track substructure. It will be observed by an examination of the cut on page 1155 that the "deflectometer" consists of a simple lever mounted on a suitable frame, having at its outer end a pointer which moves over a scale. This lever is proportioned for a ratio of 10 to 1—that is, the reading on the scale is 10 times the actual deflection recorded. The distance from the rail to the fulcrum is 4 in. and from the fulcrum to the scale 40 in. The frame is designed so that the joints of the supporting frame are adjustable to compensate for any inequality in the pavement, so that the apparatus can be brought to a true level when the readings are being taken.

In order to segregate the vertical movement from the horizontal movement of the rail, a small clamp was made to be attached to the outer side of the rail. This clamp is placed on the under and outer surfaces, and highly polished, so that the point of contact with the lever will move over these surfaces without friction.

To take readings for vertical deflection the instrument was set at right angles to the track and the frame adjusted to a true level, the clamp applied to the head of the rail and the short arm brought into contact with the under surface of the clamp. With the instrument in this position any vertical movement that takes place in the rail under load is transmitted to the pointer at the scale and is magnified 10 times. In this position the instrument records only vertical movement.

To measure horizontal movement of the rail, the other arm is brought into contact with the outer surface of the clamp, and in this position any horizontal movement is transmitted to the pointer on the scale in the same manner as when recording vertical movement.

To take readings for the deflection of the tie, a longer arm was attached to the apparatus, which was fastened to the tie by means of a screw eye when applied to wood ties, and when the observations were being made on steel ties the arm was hooked under the flange.

When readings were taken of the concrete substructure a small hole was drilled into the concrete and plugged with lead and a small screw eye inserted as in the case of the wood tie.

When these tests were taken it was expected that deflection amounting to as much as from ¼ in. to ½ in. would be found in some places. The results obtained were an agreeable surprise, for the maximum vertical deflection recorded was 5/64 in. In a large percentage of the track tests no vertical deflection whatever was noted. It was also shown by these tests that greater vertical deflection occurred at the rail joints, and decreased away from the rail joints, and that the average vertical deflection observed seemed to be about 1/32 in. No deflection whatever was observed in the concrete, and only in a very few cases was any deflection in the ties recorded. In these few instances the ties were excavated and it was found that the movement was due to improper tamping, leaving voids.

After numerous tests had been made it was determined that practically all movement took place between the base of the rail and the tie plate, and that in the majority of cases this movement was observed near the joint of the rails and disappeared entirely as the center of the rail was approached. This can be explained as follows: There is an opening left in the concrete to facilitate the welding of the joint, which is done after the concrete has been placed. When the weld is made the rail fastenings on the ties adjacent to the joint are loosened, and the rail apparently buckles when the weld is made, and in retightening the fastenings the rail was not forced back to its original position on the tie plates. When the loaded cars passed over the rail at these points the rail was forced down to the tie plate, and after the load was removed the rail would spring back again from the tie plate, which accounts for the vertical movement.

It should be noted that horizontal movement was recorded in practically every case of tests made, the average movement in this direction being about 1/64 in. This horizontal movement seemed to be a constant factor and varied but little. These tests proved that the naked eye greatly exaggerated the apparent movement of the track under load. It was discovered that, even to the eye of the trained observer, the rails that seemed to have a deflection of ¼ in. in reality did not move more than 1/64 in.

These tests also demonstrated that in many instances where vertical movement of the rail seemed to be observed, it was, in fact, a horizontal movement. The tests further proved that it was impossible for the observer with the naked eye to differentiate between horizontal movement and vertical movement of the rail.

These observations proved (1) that when the foundation is properly prepared, the concrete properly mixed and placed and the ties properly tamped, and the concrete given a sufficient length of time to properly set before traffic is allowed on the track, no movement occurs between the concrete and the soil or between the tie and the concrete, and that, when the fastenings are properly applied, no vertical movement will occur between the rail and the tie plate. (2) The observations proved that the types of construction that are being used in the rehabilitation of the tracks, as far as can be figured at this time, have the characteristics which promise a permanent substructure.

DISCUSSION

In the discussion H. B. Fleming, member of the Board of Supervising Engineers, representing the Chicago City Railway Company, gave some idea of the difficulties in handling traffic on a 20-second schedule in the central business district during track reconstruction. Three methods have been followed. One is to construct turnouts on a double-track route, using one track for traffic in both directions for a certain distance while the other is being rebuilt; the second is diverting cars to tracks in adjacent streets, and the third is the building of temporary tracks on the street where the work is under way.

Paul E. Green, assistant engineer of the Board of Local Improvements, criticised the paper in some respects. For one thing, he contended that electrically welded joints were not as good as cast-welded joints, owing to a greater percentage of breakages.

R. F. Kelker, assistant engineer of the Board of Supervising Engineers, explained the electric welding process, and said that the breakages of electrically welded joints are 50 per cent less than when cast welding is employed. Several others took part in the discussion. Mr. Weston said that very few of the breaks in track that have occurred have been in the joint. He also expressed as his opinion that streets having car tracks should not be paved with asphalt.

The Manhattan Bridge, spanning the East River about half-way between the Williamsburg Bridge and the Brooklyn Bridge, will be completed and open for traffic early in 1910. It will carry four subway car tracks on the lower deck and four surface car tracks on the upper deck.

ROLLING STOCK STANDARDIZATION IN BROOKLYN—CHANGES IN CAR LIGHTING AND HEATING

One of the features of the car standardization carried out by the Brooklyn Rapid Transit Company was the thorough overhauling of the lighting and heating equipments of all passenger cars on the elevated and surface divisions. The changes in lighting on the surface cars were made with the twofold purpose of reducing the fire risk and attaining more uniform illumination. For these reasons all clusters were removed and single lamps were placed in the clearstory while the circuits were placed in electrobestos conduit with ¼-in. transite backing and the lamp sockets mounted on electrobestos blocks, as illustrated in Fig. 1.

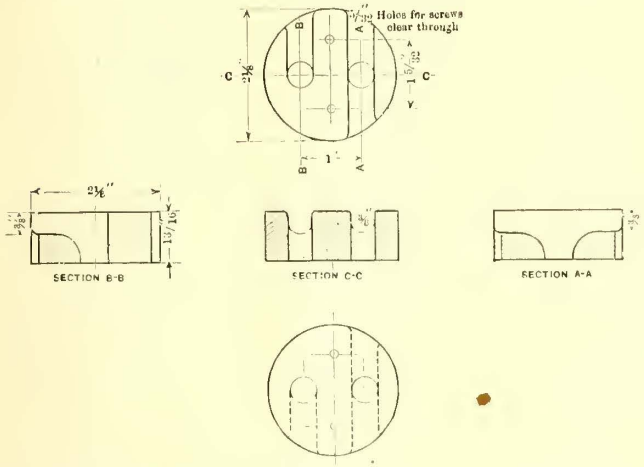


Fig. 1—Brooklyn Car Lighting—Details of Block for Lamp Socket

Fig. 2 shows the present arrangements of the lighting circuits on the principal types of surface cars. It will be noted that the lamps are connected on alternate-series circuits so that the burn-out of one lamp will not affect the adjacent lights. Originally when illuminated block destination signs were installed for the vestibules two lamps were taken from the interior of the car. It was found, however, that this change caused too great a decrease in the illumination of some parts of the car. This objection was met and the conditions considerably bettered by installing another circuit, thereby adding three 16-cp lamps for the inside lighting. The light circuits are made up of No. 14 Okonite rubber-insulated, single-braid wire.

HEADLIGHTS

At one end of the car the headlight was formerly the third lamp in the series. By making it the fifth lamp in the series, as at the other end of the car, the grounding of the headlight from water or other causes can no longer blow out the remaining lamps and fuses because the extra voltage is taken by four instead of two lamps. The two-motor surface cars are supplied with a single 16-cp incandescent headlight. The four-motor cars have headlights composed of two 24-cp incandescent lamps and an arc light for service in the open country.

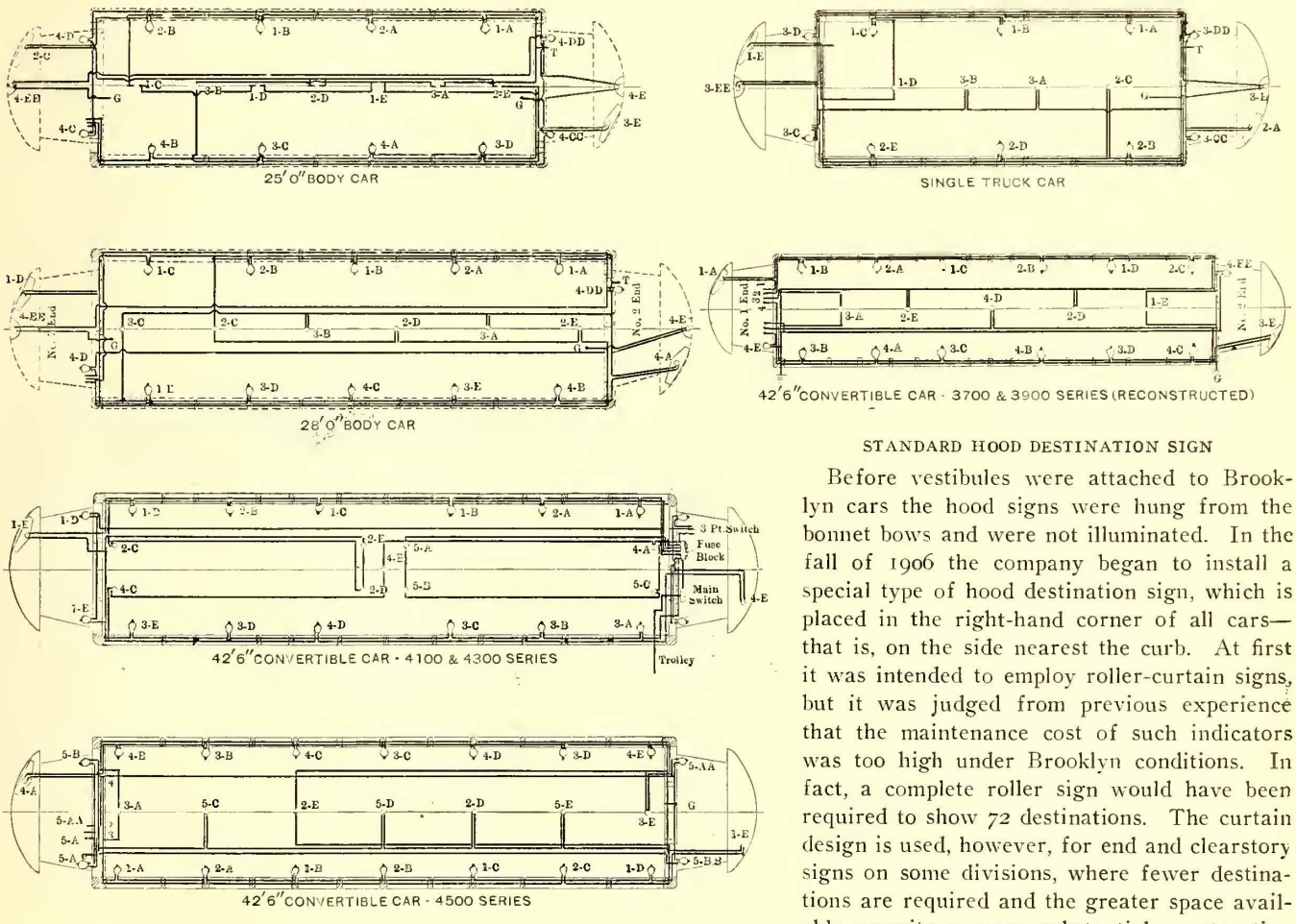


Fig. 2.—Brooklyn Car Lighting—Standard Light Wiring Diagrams of Surface Rolling Stock

STANDARD HOOD DESTINATION SIGN

Before vestibules were attached to Brooklyn cars the hood signs were hung from the bonnet bows and were not illuminated. In the fall of 1906 the company began to install a special type of hood destination sign, which is placed in the right-hand corner of all cars—that is, on the side nearest the curb. At first it was intended to employ roller-curtain signs, but it was judged from previous experience that the maintenance cost of such indicators was too high under Brooklyn conditions. In fact, a complete roller sign would have been required to show 72 destinations. The curtain design is used, however, for end and clearstory signs on some divisions, where fewer destinations are required and the greater space available permits a more substantial construction than would be possible at the hood.

The hood sign-lighting scheme finally devised permitted the use of the original four-sided block sign. The whole arrangement, which is shown in Fig. 3, has been found very effective and economical. The front of the block is illuminated by a 16-cp lamp, the end of which is at a point almost opposite the center of the sign. The top of the

hood is rounded so that no protruding shield is needed to protect the lamps. The inner upper part of the hood is lined with ¼-in. vulcabeston or transite and the sides are of sheet steel. High reflective power is obtained by coating the inside of the front and top of the hood with white enamel paint. The back of the hood is painted the standard red car color so that light will not be reflected forward

The lamp company is required to keep in reserve at the works a certain number of lamps marked for the use of the Brooklyn Rapid Transit Company. Immediately after the inspector of the railroad company has accepted lamps for shipment new packages must be reserved to make up the quota held in reserve. Lamps are tested in two ways for two distinct purposes as follows: Inspection at the lamp

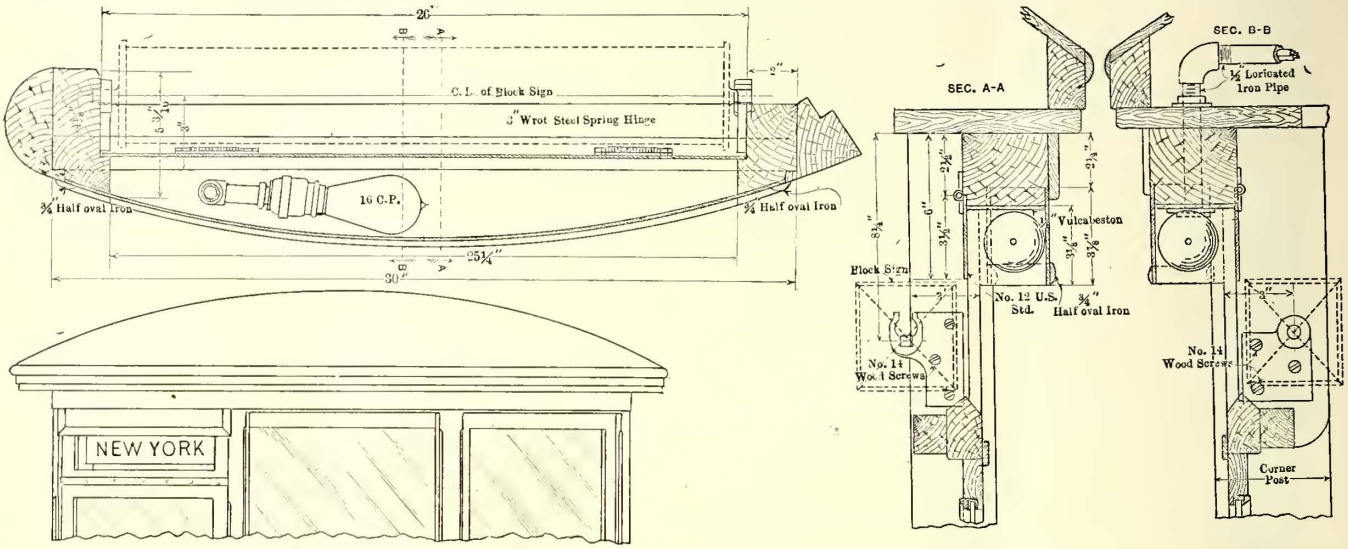


Fig. 3—Brooklyn Car Lighting—Details of Bonnet Sign

and cast a glare in the eyes of those looking at the sign from the front of the car.

Among the other construction details shown in Fig. 3 are the spring hinge attachment to permit the ready replacement of lamps and the loricated iron pipe for the lighting circuit. At present the block signs are lettered by hand, but it is planned to use an aluminum leaf transfer letter system.

LAMP SPECIFICATIONS

All incandescent lamps for rolling stock are purchased according to specifications prepared by the electrical engineer of the Brooklyn Rapid Transit Company. The lamps are of the oval anchored type and must have an illuminating intensity of 16 mean horizontal cp. They are connected across the railway circuits in groups of five in series and subjected to a potential having the normal value of 575 volts. The normal rated voltage of each lamp at normal candle-power must be 115 volts.

works by a representative of the railroad company which allows only such lamps to be shipped to the railroad as are satisfactory from the standpoint of voltage and wattage rating when the lamps are burning in a photometer at 16 cp; life and candle-power maintenance tests to satisfy the railroad that the lamps furnished are fulfilling the standard of illumination guaranteed by the lamp company.

METHODS OF TESTING INCANDESCENT LAMPS

Voltage-wattage tests are carried out in the following manner:

When the purchasing agent of the railroad has sent a formal order for the shipment of a stated number of lamps to the railroad company its inspector visits the lamp works and selects from the lot of lamps previously reserved and marked for the railroad company's use a test quantity varying from 6 per cent to 25 per cent of the total order, the test percentage decreasing with the size of the order. The percentage is also lowered if the test is made at the

Figs. 4 and 5—Brooklyn Car Lighting—Illuminated Block Sign and Illuminated Curtain Side Sign

factory. The test lamps are selected at random and measured at 16 cp in the photometer of the lamp company by its operators under the supervision of the railroad company's inspector. If 6 per cent or more of these lamps are outside of the limits of voltage, current, watts and the mechanical requirements mentioned in a later paragraph, the entire lot of lamps inspected is subject to rejection and must be replaced with acceptable lamps by the manufacturer.

Fig. 6—Brooklyn Car Lighting—Interior of Elevated Motor Car

Life and candle-power tests are made as follows:

At the completion of the work of the railroad company's inspector in accepting the quantity of lamps called for by the purchasing agent's order, he may select at random five lamps from each package of 200 and then close these packages with the seal of the railroad company. The lamps thus taken are shipped to the laboratory of the railroad company without measurements at the lamp works. Initial measurements of voltage, current and watts are made of these lamps burned at 16 cp on the railway company's photometer. Two-fifths of the lamps nearest the average of

Fig. 7—Brooklyn Car Lighting—Interior of Double-Truck Closed Car

those which came within the average limits prescribed hereafter are subjected to a life and candle-power test. These lamps are started at the voltage which would make the average lamp representing them burn at an efficiency of 3.1 watts per candle. This requisite voltage is calculated with the use of the laboratory lamp curves from photometric measurements made at 16 cp.

The life and power maintenance tests consist of 450 hours' burning at the initial voltage and exclusive of the intervals during which the lamps are removed from the lamp rack in order that photometric measurements may be made at intervals not exceeding 100 hours. The final result of the life and candle-power maintenance tests is the total cp-hours emitted in the lamp rack divided by the number of lamps with which the tests are started. The photometric measurements made on the lamps at intervals

Fig. 8—Brooklyn Car Lighting—Interior of Elevated Trail Car

not exceeding 100 hours throughout the 450 hours' tests are made at the initial voltage with which the tests are started.

MECHANICAL DETAILS OF TESTS

The lamp filaments must be symmetrically located in the bulbs and must not droop excessively when burned 450 hours on the life test without excessive vibration and in one horizontal position at a voltage corresponding to an initial specific consumption of 3.1 watts per mean horizontal cp. All filaments must be symmetrically curved

Fig. 9—Brooklyn Car Lighting—Interior of Convertible Surface Car

without kinks and free from imperfections, spots and discolorations. Leading-in wires must be fused into the glass with the joints between the copper and platinum wires well imbedded in the glass and must be straight, well separated and securely soldered to the base and cap without excess of solder. All lamps must have first-class vacuum, showing the characteristic glow of good vacuum when

tested on an induction coil giving ¼-in. to ⅜-in. spark. The lamps must have a standard Edison screw base, rendered impervious to moisture and with a short shell so that it is entirely covered when screwed firmly into the socket. In general the lamps must be uniform in shape and size, clear, free from blemishes and made to fulfil satisfactorily the exacting conditions of railway service.

CANDLE-POWER TESTS AND RANGE OF VOLTS, AMPERES AND WATTS

The candle-power tests are based on the English Parliamentary candle as interpreted by the National Bureau of Standards at Washington. Lamps are measured photometrically in a horizontal plane and are rotated in a vertical position at about 180 r.p.m. All lamps are held at 16 cp while in the photometer, the voltage and current necessary to bring them to this intensity being adjusted accordingly and measured by electrical instruments conforming with the National Bureau of Standards at Washington.

When burning at 16 cp the voltage on any lamp tested must be not less than 110.4 volts and not more than 119.6 volts. The average voltage on all lamps tested must be not less than 112.7 volts and not more than 117.3 volts. When

Fig. 10—Brooklyn Car Lighting—Center Lamps in Double-Truck Open Car

burning at 16 cp the current in any lamp tested must be not less than 0.47 amp nor more than 0.50 amp, these limits being 2 per cent below 0.48 amp and 2 per cent above 0.49 amp, the even hundredth ampere rating which is supplied in accordance with standard railway lamp practice. The average amperes of all lamps tested must not be less than 0.475 amp nor more than 0.495 amp, these limits being 1 per cent below 0.48 amp and 1 per cent above 0.49 amp.

When burning at 16 cp the watts used by any lamp tested must not be less than 52.92 watts and not more than 59.08 watts, these limits being 5.5 per cent below and 5.5 per cent above the normal power consumption of 56 watts. It is to be observed that by reason of all lamps being tested at 16 cp these limitations of power consumption are equivalent to specifications of the efficiency expressed in watts per cp, the allowable range being from 3.307 watts per cp to 3.69 watts per cp. The average power consumption of all lamps tested must not be less than 54.46 watts nor more than 57.54 watts. These limits are 2.75 per cent below and 2.75 above the normal power consumption of 56 watts and are equivalent to limitations of the efficiency between 3.404 watts per cp and 3.596 watts per cp.

LAMP GUARANTEES AND CANCELLATION

The lamp company must guarantee a standard of illumination as follows: The results of all life and candle-power maintenance tests carried out as above specified must show the average illumination emitted per lamp expressed in cp-hours to be not less than 7850. This figure is to be obtained by dividing the total integrated illumination in cp-hours emitted during a life and candle-power maintenance test by the number of lamps with which the test is started. The failure of these test lamps to conform to the foregoing standard of illumination when tested by the methods specified will cause the railroad company to reject at the next inspection all lamp packages comprising the lot from which the life test lamps were selected and may cause the cancellation at the option of the railroad company of its contract with the lamp company.

HEATING PRACTICE ON SURFACE CARS

The greater number of the surface cars are equipped with six double-coil heaters of either the Consolidated or Gold types to give 4, 8 and 12 amp. The switching equipment usually comprises two knife switches or a three-point Hart & Hegeman switch. Five-point switches with six single-coil heaters are installed only on a few closed surface cars. About 300 cars of the cross-seat type have 18-cylinder, double-coil heaters and 150 cross-seat cars have 18 single-coil heaters, but these are also arranged for the standard amperages.

HEATING PRACTICE IN ELEVATED CARS

The latest elevated cars are arranged with 18 panel and two cab heaters, all of the double-coil type, connected for three positions to give the standard elevated amperages of 6, 12 and 18. The number and style of heaters differ in the several types, but three-point switches are used throughout. Most of the other elevated cars with longitudinal seats are equipped with 12 car heaters and two cab heaters, also connected for the same amperages. The class 600 series of elevated cars are equipped with 10 three-coil heaters and two cab heaters; class 800 cars with 14 two-coil heaters and two cab heaters; the class 1000 cross-seat with 18 single-coil heaters; class 1300 cars with 24 car and two cab heaters and the trailers with 12 two-coil panel heaters. Heater circuits are carried either in electrobestos molding with transite backing or in loricated conduit which is representative of the later practice. The junction box at the end of the heater has an inner T & B bushing. The repairs of all heaters and coil replacements are made at the Fifty-second Street shops.

CONTROL OF HEATER POSITION

The heater positions are not controlled by the trainmen, but are set according to orders telephoned from the main office of the transportation department at intervals of 30 minutes if necessary to all depots and other dispatching points. These instructions simply call for "0," "1," "2" or "3," and when received the dispatcher or depotmaster hangs out the proper sign, which bears no other marks than the plain figure. These heat instruction signs are of enameled metal and are set in wooden frames supplied with a lamp and reflector for night use. When installed at junction points they are hung from the switch towers. At the car houses the signs are placed so that they can be readily observed by passing crews. Under normal conditions the switches are set as follows: First point from 40 deg. to 30 deg.; second point, 30 deg. to 20 deg.; third point, 20 deg. and below. No discretion in regulating heater positions must be exercised by anybody at the dispatching points, but the main office must be called up for revised orders in the absence of definite instructions on the temperature schedule.

MEETING OF THE CENTRAL ELECTRIC ACCOUNTING CONFERENCE

The ninth meeting of the Central Electric Accounting Conference was held at the general offices of the Scioto Valley Traction Company, Columbus, Ohio, on June 19. The program and attendance made the meeting one of the most successful that has been held by this organization. Robert N. Wallis, president of the American Street & Interurban Railway Accountants' Association and treasurer of the Fitchburg & Leominster Street Railway, attended the meeting for the purpose of showing the interest of the national association in the work of the interurban organization. The discussion which followed the remarks made by Mr. Wallis on this subject indicated the appreciation by the speakers of the value of local organizations and emphasized the importance of co-operation by all associations of this character in movements that affect the industry as a whole.

After calling the meeting to order, the chairman, M. W. Glover, auditor, Ohio Electric Railway, made a statement concerning the affairs of the conference, in which he said:

STATEMENT OF MR. GLOVER.

On Jan. 19, 1907, a meeting of accounting officers was held in Lima, Ohio, to discuss the settlement of interline accounts between electric railway lines of Ohio and Indiana that had been interchanging both passenger and freight business for several years without any uniform method of settlement having been adopted. Nearly every line carried on its books interline accounts the details of which could not be accurately verified, caused partly by the absence of agreements covering the interchange of freight and passenger business, and partly by the lack of uniformity in such agreements as existed.

The necessity for an improvement in the situation was apparent to every one present at this meeting, and it was decided that an association of some kind should be formed to bring into closer touch the accounting officers of lines in the Central States and to formulate a uniform plan of settlement between carriers. As a result a meeting was held in Dayton, Ohio, on March 2, 1907, and at this meeting the Central Electric Accounting conference was organized, 17 members being present, representing 19 lines, all located within the States of Ohio and Indiana.

The second meeting of the conference was held at Indianapolis on June 1, 1907, 19 members being present, representing 12 lines.

The third meeting was held at West Milton, Ohio, on July 13, 1907, 20 members being present, representing 12 lines.

The fourth meeting was held at Lima, Ohio, on Feb. 11, 1908, 32 members being present, representing 19 lines.

The fifth meeting was held at Lima, Ohio, on April 23, 1908, 25 members being present, representing 23 lines.

The sixth meeting was held at Indianapolis on Oct. 3, 1908, 16 members being present, representing 14 lines.

The seventh meeting was held at Lima, Ohio, on Nov. 18, 1908, 26 members being present, representing 22 lines.

The eighth meeting was held at Lima, Ohio, on March 6, 1909, 25 members being present, representing 19 lines.

If the conference had accomplished nothing more than the settlement of the old accounts between lines, its formation would have been justified, as these accounts could never have been settled without loss to the various lines interested except through the adoption of a uniform method of handling interline business and making settlements for balances between carriers. The conference did more than this; it brought together a body of men who, although familiar with the signatures of their neighbors, had never met them personally; and every one knows the advantages, from a business standpoint, of a personal acquaintance with those with whom business is transacted daily.

Rules have been adopted by the conference for the settlement of interline accounts, which are now working in a satisfactory manner, and the rules governing the settlement of freight claims have also proved valuable.

At the fifth meeting, on April 23, 1908, Interstate Commerce Commission circular No. 20 was discussed, and a joint criticism was adopted, setting forth the views of electric railway accountants, in accordance with the request of the commission for suggestions and criticisms.

So far, the conference has been successfully carried on for over two years, and at the last meeting a constitution and by-laws were adopted, but unless the members take an active interest in its work and attend all regular meetings the influence of the conference, as stated in the constitution, will not be attained.

Another matter which should not be overlooked is the fact that the conference has been carrying out the work outlined for two years without assessing any dues or making any charge for membership. The only expense attached to the conference has been the cost of printing rules governing the settlement of claims and interline accounts, which were distributed at cost at 15 cents per copy to such members as wished them, and 90 cents to defray the cost of printing the uniform blanks adopted at the seventh meeting of the conference. I believe this is a record not equalled by any other association of the kind anywhere.

William A. Forse, Jr., treasurer, Indiana Union Traction Company, then introduced Mr. Wallis, who spoke in part as follows:

REMARKS OF MR. WALLIS

It is a pleasure for me to be present to extend assurances of the desire of the American Street & Interurban Railway Accountants' Association for a hearty co-operation with your conference, which I am authorized by action of our executive committee to do. Many of you are members of that association. I wish every one of you might be. But whether the membership of this conference is wholly or only in part enrolled also among the Accountants' Association membership, the relations between the two bodies should at all times be most cordial and intimate. We are all members of one family; our interests in a large way are identical.

It seems to me that local or sectional organizations of electric railway accountants should be encouraged for the interchange of ideas and the making of acquaintanceship. As you are aware, many national associations have such locals as part of their organization. The larger association can meet but once a year, and only in short sessions, while the members of a neighborhood association can meet frequently with great advantage and with resulting closer relationships.

One principal advantage of a sectional organization such as yours is that much educational and missionary work may be done. Discussion is much more personal and intimate and minute details can be taken up which are necessarily difficult to include in a program of a national organization. Much may be done in the way of help to the newcomer in railway accounting in order that he may avoid some of the mistakes which he would make if he were obliged to feel his way unassisted. The members who are older in the business should feel it their duty to help the recruits in the interest of a continually higher standard of accounting efficiency.

Such a sectional organization as this can do much toward setting up a high ideal of the electric railway accountant. We must continually aim to improve and advance our branch of the industry in order that we may become always more valuable to the business and the community. The intimate acquaintanceship in such a conference as this permits you to insist upon greater efficiency of method and result. It seems to me to be the duty of your organization as well of the one I represent and of each of us individually to interest the shy, modest, retiring fellow who, when drawn out, proves to be a mine of work and ideas.

Herein lies the great benefit to the national organization of close co-operation with you: That it may have the benefit of the results of the work and experience of your more frequent, more intimate conferences. Through your frequent interchange of ideas here you are better qualified to pass upon the questions which present themselves to the national organization affecting not only interurban properties or your own section, but also the whole industry and the entire country.

Your conference was formed to consider problems which arose in the development of the interurban feature of the business in which much more has been accomplished in this immediate section than in any other part of the country. With you the Accountants' Association wishes to join hands in the solution of these problems. In this work we are blazing a trail in a comparatively new branch of the industry—the accounting of through or interline business. Of necessity here more than in any other part of our accounting must there be uniformity. It is a large responsibility thrown upon us. We must go carefully, mold, change, perfect.

We have steam railroad practice to guide us in this work. It is the result of decades of experience and we would be foolish indeed if we did not avail ourselves of it. I believe you have done wisely in following this experience in your work. But we must not forget that steam railroad practice is suited for steam railroads and that the electric railway presents a different problem. We should not regard steam railroad practice as final in our work because it is traditional. We must adapt, not adopt.

The Accountants' Association's committee on interline accounts is considering these problems and through its report they will be brought up at the next convention of the association for discussion, which will be the first step toward securing uniformity of practice in this branch of accounting throughout the United States. Two of the important functions of the American Association are in securing uniformity of method and in encouraging a high standard of efficiency.

As I have previously expressed it to you, the Accountants' Association is desirous of learning from you what it can do to be of assistance to you. I am here principally to find out if I can what need of yours the association can fill. To that end I hope that suggestions will be offered through me to the Accountants' Association.

Gentlemen, I thank you for allowing me the opportunity of showing the Accountants' Association's interest in your work.

Chairman Glover stated that the conference was a small organization, holding meetings from time to time. He was satisfied that he could say for every member that it was realized that the conference represented a part of the industry, and that all wanted to work in harmony. The conference simply wanted to keep its members posted on questions of local importance.

P. V. Burington, secretary and auditor, Columbus Railway & Light Company, followed, saying in part:

ADDRESS OF MR. BURINGTON

The position each of you occupies as an accountant is threefold: First, to represent the executive management; second, to formulate and systematize executive and operating details, and, third, to make an intelligent record. To be the representative of the management means that you will be expected to know and correctly interpret the wishes of the executive management along the various lines of financial and physical operation requiring careful accounting so that it may be at all times fortified in the execution of its plans and policies. To formulate and systematize details means to be able to gather together for each branch of the business and for the business as a whole all of the essential divisions and subdivisions which will enable the management to discern at a glance what the property has done, is doing, or may do, as a going concern. To make an intelligent record means that the bookkeeper should be able so to arrange accounts on his books that there shall always be each item of classification by itself, making every entry, whether by days, weeks or months, in consecutive order, and gathering as far as possible into these periods each individual item of receipts or expenditures belonging each to its proper period, so that a direct and reasonable comparison may be made with the day, week or month preceding, or any or all of these periods with like periods of the previous year. The preparation of reports from these records for the information of the executive and operating heads becomes an easy procedure for the reason that reports must of necessity conform to the classification of accounts.

In outlining the threefold requirements of a modern electric railway accountant we are disposed to give less emphasis to the bookkeeping feature than to the others. The former is a work of routine rather than of origin. The responsibility and labor of interpreting the needs of the management is the more important feature, seconded only by the ability to master the other feature of collecting and putting into intelligent form the results of such interpretation before the matter shall go to the bookkeeper. To be sure, the efforts of the American Street & Interurban Railway Accountants' Association to furnish a complete classification have made it comparatively easy for the electric railway accountant to proceed along definite lines, as has also the Interstate Commerce Commission classification, but they do not altogether meet the requirements of each of your individual companies or solve some of the problems you are confronted with. It is to some extent for the purpose of solving these omitted or dissimilar problems that you meet together. It would indeed be a miraculous classification that could be said to cover all of the thousand and one details of your business, and to you is left the more delicate duty of harmonizing and supplementing in order that your management may be satisfied. This is not the work of the bookkeeper, but rather that of the originating accountant. It is very gratifying to modern men of accounts that the larger industries and corporations have assigned to a wider field of responsibility the men to whom they look for the logical treatment of results as an important factor of their success.

To the thorough and broad-gaged accountant this is an encouraging evolution from the routine bookkeeper of only a few years ago, principally for the reason that he is enabled to come in close touch with men of affairs and stand some reasonable chance of advancing to a place of greater moment by reason of the greater knowledge he has been permitted to absorb.

The interurban electric railways of Ohio to-day are acquisitions of which the people should be proud, forming as they do a large proportion of the interurban systems of the Middle West. The attention of the investing public was well centered on expansion when the late depression set in and new construction came to a halt. Capital is now gradually coming out from its hiding, and the prospect is brighter for the further betterment of the present systems and the formation of new lines and links to bring the people in closer touch and stimulate a more rapid commercial intercourse. By its natural position it is expected that Ohio will be foremost in the advance and nothing perhaps but the withholding of capital can hinder.

To me the outlook seems brighter by reason of a change now going on in public sentiment looking to a more careful and businesslike consideration of the rights of capital invested. It is being found that the results from attempted wholesale restriction and curtailment of public utilities by legislative and other processes are disastrous to the growth and expansion of the communities in which these utilities operate. In the drift of public opinion for the past few years no sane allowance has been made for a fair return on the actual cost of property and no leeway considered for the accumulation of a reasonable surplus to take care of times of depression or of extraordinary expenditures resulting from disaster or other causes or of depreciation of property constantly going on, the great plea being to allow only a commercial interest per cent profit on an appraised tangible value of the property as existing. With such a sentiment is it any wonder that capital has been stagnated and the tide of a growing and prosperous country turned back?

These things are of vital interest to you as accountants, knowing as you do how much they have had to do with the sought success, or unsought embarrassment, of the properties with which you are connected. We may therefore hope for something better in the near future, and as you all desire to acquire breadth of knowledge, you should be cognizant of these things and all else that is helpful to you and your superiors. It is by these mutual gatherings that we are brought to know ourselves better and to know others better.

INTERSTATE CLASSIFICATION OF OPERATING EXPENSES

Mr. Forse, who is a member of the committee on stand-

ard classification of the American Street & Interurban Railway Accountants' Association, mentioned the objections that had been made by various companies regarding the difficulty of making comparisons with results reported under the old system, but said that condition would probably be the same with any new classification. Among the other difficulties were those which had been met by companies operating different classes of utilities.

Mr. Forse also spoke of the large amount of work that had devolved upon the committee in connection with the interpretation of the accounts with the Interstate Commerce Commission representatives.

Chairman Glover spoke of the appointment at the last meeting of a committee of the conference to which it was desired that members should send their questions to be submitted in turn to the American Association committee, and urged members advise the committee of their difficulties.

Mr. Wallis said it would be an excellent plan to take up with the committee all questions about which there was any doubt. Only in this way could the committee learn the defects of the classification. This would tend to greater uniformity, for which all were striving.

Mr. Forse said that the committee passed on 58 questions at its recent meeting in Washington. The text of these questions and answers was now in the hands of the public printer and would be issued in pamphlet form by July 1, it was expected. The references would be indexed and cross-indexed thoroughly.

A question was asked regarding storeroom accounts. Mr. Glover said the subject of storeroom accounts was an important one and the executive committee had considered the advisability of considering it at this meeting, but had finally postponed it until some future date.

TRAFFIC STATISTICS

L. T. Hixson, auditor, Terre Haute, Indianapolis & Eastern Traction Company, said in discussing this subject that traffic statistics might be divided into two classes, one pertaining to revenue, the other to operation. If these statistics were to be of value for comparative purposes it would be necessary to know on what basis they were compiled. If car-mile revenue was stated it was necessary to know what revenue and what car-miles were used. The uses of statistics of this nature were left to the traffic and operating heads of departments, but the preparation was the duty of the auditor. There were difficulties in arriving at passenger traffic revenues and expenses per car-mile. Some items of expense were directly chargeable to this business, but others were indirect.

Most roads, Mr. Hixson thought, used the car-mile and the car-hour for units, but very few seemed to use the passenger-mile. He did not know whether the use of this latter unit paid for the expense of working it out. Personally he was in favor of preparing few traffic statistics and recently had been using the car-mile to the exclusion of others.

Chairman Glover said that some companies used revenue car-miles and others the entire mileage; all ought to follow a uniform method.

James S. Clark, auditor, Marion, Bluffton & Eastern Traction Company, had used traffic statistics successfully when it was desirable to make a change in schedule. These showed what trains were doing the most business. The expense was only about $3 to $4, covering the cost of envelopes for each train and one form for a record. After getting the results of one month the next month was skipped and the experience then resumed in order to develop the facts in various seasons and independent of special traffic movements.

Mr. Glover had followed the practice of reporting separate train earnings on two-thirds of the system and the operating department had found the information very valuable.

Mr. Hixson said that the experiment of having men ride on the cars to make observations concerning the individual trains did not result successfully, as the reports were likely to indicate business as good or poor according to the state of mind of the observers.

F. K. Young, auditor, Scioto Valley Traction Company, showed earnings per passenger and per freight car-mile, but expenses per car-mile only. He had always kept a record of earnings by trains. The tickets were deposited at the end of each trip and the report of the earnings for one day was out by 10 a. m. the following day. At the end of the month the information was sent to the management. While it required extra work to keep this record he thought it paid to have it in detail.

TIMEKEEPING AND PAYROLLS AND BEST METHOD OF PAYING EMPLOYEES

A paper on this subject, written by S. C. Rogers, treasurer, Mahoning & Shenango Railway & Light Company, who was unable to be present, was read in his absence by E. D. Gault, auditor of the same company. This paper is published on page 1164 of this issue.

A. F. Elkins, auditor, Columbus, Delaware & Marion Railway, said that it was necessary for him to do the work required at the least possible expense that would yield the results desired. The company never paid in cash. Except in Columbus there were no saloons in the territory through which the road operated and the proprietors of the local stores always knew the dates when the men were paid and prepared in advance to cash the checks.

Irwin Fullerton, auditor, Detroit United Railway, described the method followed by that company in paying trainmen. Currency was used. The motormen and conductors had their names printed on sheets and duplicates were secured by the use of carbon paper. The foreman of each car house indicated the time made opposite each name. When the man finished his work he signed his name to the record indicated. The time sheets were then sent to the auditor's office and abstracts made on the payrolls. The total number of hours was added and checked by the schedules. Blank receipts for pay were sent to the car-houses and each man made out his own receipt and presented it to the paymaster. If the paymaster found that the package of money bearing the name of the man agreed with the amount on the receipt he exchanged the envelope for the receipt. If he found the amount in the envelope greater than that stated in the receipt he took out the difference; if the amount was less he gave the trainman what the envelope contained, made a memorandum on the receipt concerning the discrepancy and asked the man to call at the general offices. This system had been in effect in the company for seven or eight years.

A resolution was then passed thanking Mr. Wallis for his attendance and interest in the work of the conference.

After selecting Indianapolis for the next meeting, to be held on Sept. 11, the conference adjourned.

Bucharest, the capital of Roumania, has announced a loan of $2,000,000, of which $600,000 will be used in the construction of a municipally owned tramway system.

TIME-KEEPING AND PAY ROLLS AND BEST METHOD OF PAYING EMPLOYEES*

BY S. C. ROGERS, TREASURER, MAHONING & SHENANGO RAILWAY & LIGHT COMPANY

The method of time-keeping employed by our company is, briefly, as follows:

TRANSPORTATION DEPARTMENT

Car service men turn in to the dispatchers daily an individual time slip, indicating the time on and time off and elapsed time, name, number and division. This individual time slip, if correct, is approved by the dispatcher and sent to the chief clerk of the transportation department, under whose supervision it is recorded on a separate form for each company or division, in duplicate. The heading on this form calls for the total number of hours according to the schedule on the divisions. If the total time recorded from the individual time slips exceeds the scheduled time, it must be accounted for in the column specifying extra runs, and the notation at the foot indicating the reason therefor. The original and duplicate of this form goes to the superintendent of transportation, who affixes his approval to the total time for the day thereon shown, sending the original copy with the individual time slips to the accounting department. The general time-keeping department, as part of the accounting department, compares the individual time slips with the record made by the transportation department, makes the calculations and fills in the amounts for each man in dollars and cents.

You will notice that the accounting department has by this method the personal signature of the superintendent of transportation as approval on every hour of time of the employees of his department. The transportation department also has in the duplicate copy of the record a daily record of the time of the department.

CAR BARN DEPARTMENT

A recording time clock is used in our general car barn, each employee taking out a card indicating the time of arrival, which is inserted and stamped at the time of leaving, and left with the clerk at the car barn office.

The method of recording is exactly the same as in the transportation department—that is, these individual time cards are recorded by the clerk at the car barn office, in duplicate, the original of which is signed by the mechanical engineer in charge of the car barn. The time cards accompany the original copy to the accounting department, the duplicate remaining on file in the car barn office.

POWER HOUSES

An individual time slip is prepared by each employee of this department and recorded by the clerk at the main power house, in duplicate, the same as in the case of the transportation and car barn departments.

METHOD OF PAYMENT

Payments are made on the 5th and 20th of each month, covering to the 15th and 30th or 31st of the month, as the case may be; in other words, five days elapse between the termination of the payroll and date of payment.

An order on the paymaster is prepared and signed by the timekeeper for each employee, in the form of a card, with spaces for the approval of the superintendent or foreman of the department in which the man is employed, and for the signature of the employee as a receipt. These card orders are sent to the several superintendents the day previous to the date of payment, and after approval by the superintendents, are distributed to the employees. The employee presents the pay order card to the paymaster, where prior to payment it is compared with the payroll, and if the amount agrees and the card is properly signed by the timekeeper and approved by the department superintendent and receipted by the employee, the money is paid in cash.

Our present system of payment involves the operation of the pay car over the system. We have, however, been considering the advisability of doing away with this pay car and the payment of all employees at the offices of the company, either prior to or before entering upon their duties for the day or night, as the use of the pay car requires many of our employees to leave their duties during the day to get their wages. It also causes some inconvenience to our car service men who are on night runs. The element of risk which is involved in the use of the pay car would not be nearly as large if payment were made at the offices of the company, where the money handled could be better protected.

All employees other than the general officers of the company, who are on what we call the "check roll," are paid according to the plan above mentioned.

Prior to the installation of this system many questions arose between the employees and the timekeeping office on the question of time allowed, because the large volume of time slips handled made it impossible for the superintendents personally to inspect and approve each time slip. They of necessity delegated this duty to some one else, and in many cases it was done in a perfunctory manner by a clerk who did not exercise proper care or did not understand the importance attached to his signature when affixed as approved to a time slip.

Since the installation of the present system, however, the questions regarding time allowed have been reduced to a minimum. To such an extent is this true that it is very rarely that we have any question between the timekeeping office and an employee.

One of the very great advantages of this plan is that it furnishes the operating superintendent in charge of the department with a record of the time charged to his department daily, and he is thus enabled to effect economies that under the old plan were practically impossible; and as a protection to the accounting and treasury departments in the payment of employees it gives an authorized personal approval on all time recorded and paid, and no question can arise after the pay order is presented and paid and the receipted pay card filed. The paymaster is protected in the payment of the wages, as he pays only on a properly signed, approved and receipted pay order card.

In the case of employees discharged prior to the date of payroll, the department issues an order on the timekeeper, which is taken up and pay order issued by the timekeeper on the paymaster.

It is the writer's opinion that this matter of keeping time and paying employees, owing to the large percentage of the operating and construction expenses of a railway company represented by labor and the many opportunities afforded for error, should and must be surrounded by all the protection possible, and yet a system outlined that will allow the work to be done with the least amount of inconvenience to the employees, consistent with the protection of the company's interests. I maintain the principle that the operating superintendent in charge of any particular department is the responsible head of that department, and as such should be required to affix his personal approval on the daily record of time of employees in his department. This you will notice, however, is not taken as final by the accounting department, because not only this approved daily record is turned in, but also the individual time slips forming the basis of such record, and if, upon comparison, any errors or omissions are discovered, the operating superintendent is immediately notified and corrections made with his approval; no changes are made in the time recorded to the credit of an employee without the personal approval of his operating superintendent.

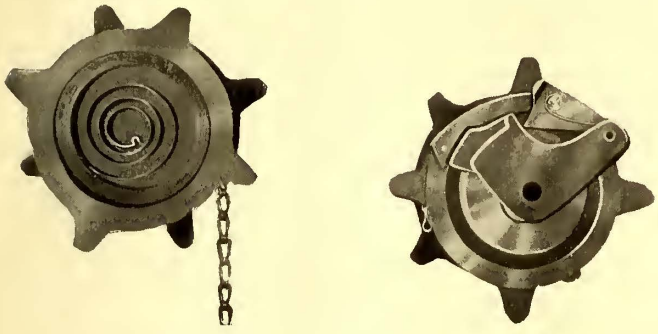
The question may arise as to the amount of time expended by the operating superintendents in recording the daily time in the manner outlined. Each department superintendent with us has a chief clerk, and the work is done in connection with other duties of the clerk, and takes but little of the clerk's time when done every day, particularly as these clerks do not make the extensions; they simply record the name, total time and account chargeable.

*Abstract of paper read before the Central Electric Accounting Conference, Columbus, O., June 19, 1909.

At the power station of the Columbus, Delaware & Marion Railway a fare register has been connected up so that it will count the number of wheelbarrow loads of coal weighed on the power house scales. The register is installed over the weighing platform and is operated by means of electrical contacts.

A SHORT-PULL TROLLEY CATCHER

The Lord Electric Company, New York, is now making a new form of the Earll trolley catcher known as the No. 9 Short Pull. This catcher is designed especially for city service and in general for use on roads where the maximum speed is no greater than 20 m.p.h. to 25 m.p.h. While constructed along the simple lines of the regular trolley catcher,



Short Pull Trolley Catcher

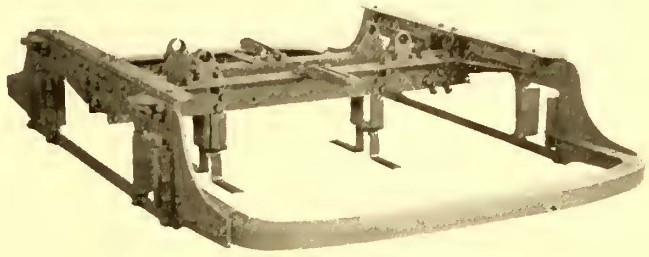
it is as effective as a trolley retriever in preventing the pole from striking the wires. Instead of retrieving and pulling down the trolley, it has the effect of relapsing the pole, causing it to take a fixed position below the point at which it left the wire. This position below the wire varies from 8 in. to 12 in., according to the height of the wire. After operation the catcher is reset simply by pulling out a foot of rope. The trolley wheel cannot be restored to the wire unless the conductor first resets the catcher as indicated. The maintenance cost of this short-pull catcher should be a small item, as the device contains only three moving pieces besides the drum. The catcher can be easily installed on or removed from the dasher to permit its ready transfer from one end of the car to the other.

PLATE FRAME MOTOR TRUCK

The American Locomotive Company has recently built a pair of electric motor trucks for the United Traction Company, Albany, N. Y., which are a new development in electric motor truck construction. In the builder's classification they are known as Type S-154, having a wheel base of 54 in. and being built to carry a load at center plate of 14,350 lb. Each truck is equipped with two General Electric Company's type 80-A motors, having a rated capacity of 40 hp each, suspended outside of the axles on a spring-supported yoke. These trucks are designed for operating at a speed of 30 m.p.h., and have been applied to one of the cars on the Albany and Troy division of the United Traction Company.

The frame construction is clearly shown in the accompanying illustrations. Each side frame is machined from a solid, high-tensile strength steel boiler plate, and the two are tied together at the ends by steel angles. Wrought-iron pedestal guides or shoes upon which the journal boxes slide are riveted to the pedestals. The transoms are of steel angles and are rigidly secured to the side frames through the medium of steel and castings to which they are bolted, and which are in turn bolted to the side frames, also by steel plate gussets. The transom end castings also serve as wearing pieces between the bolster and transoms. A special design of gusset has been employed, the gussets on both sides of the transoms being pressed from a single steel plate, which also forms an angle extending along the top of the frame on the inside for practically the entire length. This construction not only makes a very rigid connection between frames and transoms, but also serves to stiffen the frames laterally.

The swinging bolster is of strong, but light, construction. It is pressed from a steel plate and weighs about 200 lb. less than a cast-steel or built-up bolster of the same capacity. It is carried on elliptic springs, while the truck frame is supported by coil springs on the journal boxes, one on the inside and the other on the outside of the frame, the load being thus uniformly distributed on the journal.



Truck Frame

The elliptic springs supporting the bolster rest on cast-steel spring seats, riveted to the spring plank, which consists of two angles. These seats are provided with three semi-circular pockets for the swing link pin or gib, so as to permit of adjusting the angularity of the swing link, in order to increase or decrease the resistance of the bolster to swinging by changing the swing link pin from one pocket to the other. These pockets are so designed that the position of the swing link pin does not alter the height

Pressed Plate Truck Bolster

of the spring plank. This can be adjusted, if necessary to maintain the proper height of the platform or steps, by the use of a thicker or thinner swing link gib.

The service trials of this truck, which have extended over a period of about three months, have fully demonstrated the easy riding qualities afforded by the arrangement of the swing links and springs, which, it is claimed, prevents any unpleasant lateral swaying or oscillation when running at a maximum speed on a rough and uneven track.

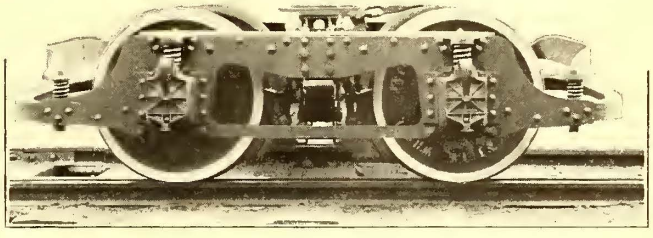


Plate Side-Frame Truck for City Service

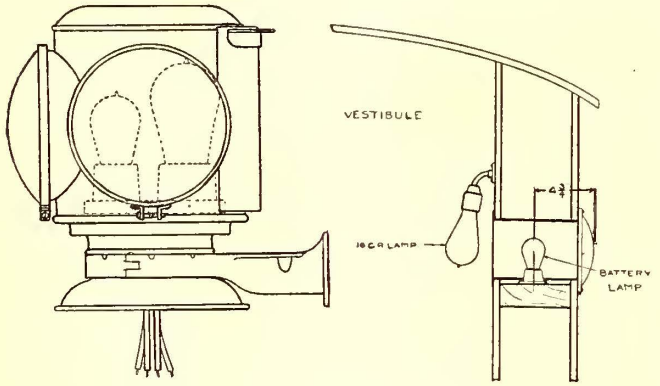
In developing this design the purpose was to obtain a truck of the specified capacity and of as light a weight as possible. Compared with a bar-frame truck of an equal capacity and the same wheel base, the truck illustrated is from 1000 lb to 1500 lb. lighter. This is a saving in weight of 2000 lb. to 3000 lb. per car. This plate frame type of construction is equally applicable to the largest trucks.

Some of the principal dimensions of the truck are given below:

Length over all	10 ft. 4 in.
Load carried at center plate	14,350 lb.
Weight without motors, wheels or axles	3346 lb.
Weight complete, without motors	5946 lb.
Number of motors on each truck	2
Weight of each motor, complete	2800 lb.
Wheels, diameter	33 in.
Axles, diameter	4½ in.
Journals, diameter and length	3¾ in. x 7 in.
Radius of shortest curve	32 ft.

ELECTRIC CAR SIGNAL SYSTEM

The Ohio Brass Company has just placed on the market a new electric car signal system to provide signals for classification and rear end markers for electric cars, to operate with or without main line current. This system is said to be easier to maintain and operate than oil lamps. Its greater cleanliness, because of the absence of smoke and oil, insures clear signals at all times. Unlike oil lamps, the signals do not jar, nor is there any fire risk. As the apparatus is permanently attached to the cars the signals cannot be forgotten, and the throwing of a switch is all that is necessary to place them in service. If desirable, some light can be provided within the car should the main trolley current fail. This auxiliary illumination also indicates to the conductor that his signals are operating.



Figs. 1 and 2—Combination Lanterns

The following figures have been prepared by the manufacturer to show that the oil lamp system really is more expensive than the electric system. It is assumed that four lanterns per car are used, this being the ordinary equipment of a double-end car displaying two tail lights at one end and two classification lights at the other. The battery depreciation is figured at a life of two years and a half. Under these conditions the total cost of operation per car with oil signals is given at $66.60, and with the electric system $20.64. In the single-end car the saving is estimated at $17.98 per car.

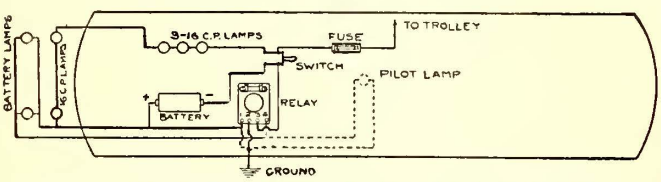


Fig. 3—Single-End Car, with Two Red Tail Lights

In the O-B system each signal lantern is normally illuminated by a 16-cp lamp connected directly to the trolley circuit. In each lantern, however, there is placed a low-voltage battery lamp, as shown in Fig. 1, which is automatically lighted by a positive operating relay connected in series with the main signal lamp, in case the latter fails to burn. This relay is also adjusted to cut out automatically when the main signal lamp burns too dimly to give a clear signal. The current for lighting the low-voltage auxiliary lamp is supplied by a storage battery, which is always kept charged by the relay. The low-voltage lamps in this system are especially designed to withstand car vibration.

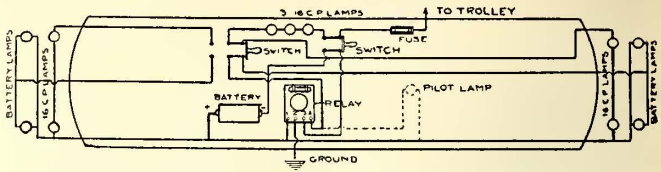


Fig. 4—Double-End Car, with Four Red Tail Lights

As the filaments are of tantalum, the current consumption for the amount of light given is very low.

As only one circuit of 16-cp lamps is used to make up the main signal circuit, it is unnecessary to disturb the regular car lights. Each signal lantern contains a 16-cp lamp, so that when fewer than five signal lamps are used there will be one or more 16-cp lamps available for car lighting.

The signal lanterns are furnished in two styles—the "Duplex" tricolor, with white, green and ruby lenses, and the "Duplex" ruby, with one lens. The tricolored lamp is adjustable for turning any of the three colors into position, and so can be used for classification or tail lights. The other lamp is a rear-end signal or tail light. In some cases the oil signal lanterns can be changed over for electric operation at slight expense. The accumulator or storage battery may be placed under a seat, as the entire case is only 14½ in. high, 8¼ in. wide and 11½ in. long. The battery jars are of heavy hard rubber, with insulating compound surrounding each jar.

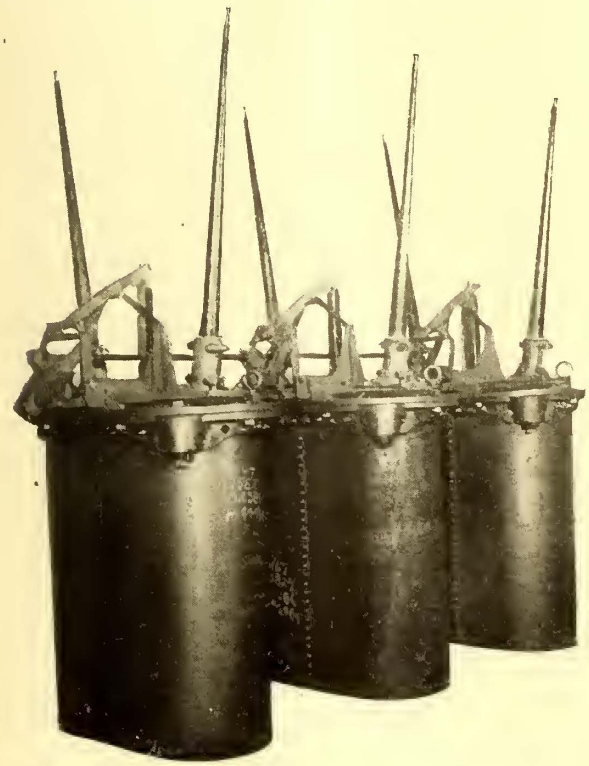
A CONDENSER-LEAD CIRCUIT BREAKER

The Westinghouse Electric & Manufacturing Company has developed a heavy capacity oil circuit-breaker known as the type GA. This breaker consists of single pole units, each enclosed in its individual boiler steel tank, with separate operating mechanism, leads, etc. All the operating parts are mounted on the cast-iron top, and are operative on the top, so that the mechanism may be lined up before it is dropped into the oil tank. As the connection between the poles is only a piece of ¾-in. gas pipe, the poles may be spaced any convenient distance apart. The pipe is used as a pull rod, being in tension only. It is impossible for the different poles to stick due to improper alignment, as they may be placed several inches out of line without making the angle of pull sufficient to jam the mechanism.

The breaker is made for four potentials—44,000, 66,000, 88,000 and 110,000 volts, hand or solenoid operated and with any number of poles. The automatic circuit-breaker is furnished either for use with series transformers or with a self-contained series trip. Time limit features may be incorporated if desired. The breaking capacity is practically unlimited, the heavy boiler steel tanks and cast-iron top giving great strength against internal pressures. The total travel of the moving contacts is large, there being two breaks in series at each pole. Each break takes place in a separate compartment, separated from the other pole by double barriers of insulating material. The break is between brass and copper, materials which have been found to give the best protection against burning. Each moving

contact piece has its own heavy steel spring to take up any wear due to arcing, and slides across the stationary piece with a rubbing motion, keeping the contact bright. In this form of circuit-breaker there are only three insulation points, namely, the two leads and the wooden rod. The rod, being of moderate cross-section, can be easily and thoroughly dried and impregnated, and is well immersed in oil at all times, so that its factor of safety is large.

The maker believes that the condenser type of lead used in this breaker marks a great advance in high-tension work. The problem of carrying a high-tension conductor through a grounded surface has been one of the limiting factors in developing higher voltages. Due to the fact that it was impossible to maintain the same stresses in all layers of insulating material, on account of the unequal distribution of potential in them, excessive amounts of insulation were required to secure safety. It was even found necessary to remove all grounded material from the neighborhood of



Type GA, Three-Pole Oil Circuit-Breaker for 60,000 Volts

the conductor, and various further methods have been used, such as oil-filled terminals, double or triple porcelains and excessive amounts of varnished cloth or paper. In the Westinghouse type G breaker, which is regarded as the standard for 66,000-volt transmissions, providing the protection for both the Niagara and Southern Power Company lines, heavy soapstone tops, varnished cambric leads and expensive and cumbersome porcelains were required. The contrast in the type GA breaker is surprising. A moderate-sized lead made up of alternate layers of tinfoil and insulation is fastened solidly into cast-iron flanges, and at voltages far in excess of that required to break down former constructions these leads show no static discharge or other evidences of strain.

All the cars of the Liverpool Corporation Tramways are to be fitted with an automatic bell or light signal device which will indicate to the motorman when a passenger attempts to board or alight. The device is the invention of C. W. Mallins, general manager of the tramway system.

MEETING OF THE COMMITTEE ON STANDARDS

The committee on standards of the American Street & Interurban Railway Engineering Association held a meeting in Atlantic City on June 21 and 22, to consider some of the subjects assigned to it by the executive committee of the association. The members of the committee present were W. H. Evans, chairman; H. H. Adams, Metropolitan Street Railway, New York; James Heywood, Philadelphia Rapid Transit Company, and B. Penoyer, Schenectady Railway Company. Paul Winsor, president of the Engineering Association, was also present, as were N. W. Storer, Westinghouse Electric & Manufacturing Company, and G. L. Schermerhorn, General Electric Company.

At the meeting of the committee on Monday a number of communications suggesting possible modifications of the existing standards were informally discussed. L. L. Smith, master mechanic of the Chicago & Milwaukee Electric Railroad Company and a member of the committee on standards, sent a letter calling attention to the need of larger axles for heavy, high-speed interurban cars than any of the present standard axles. No action was taken on this recommendation, which was referred to the committee on equipment.

The extent to which the existing standards have been adopted by member companies during the last two years was brought up for discussion by Mr. Evans, and suggestions were asked from members of the committee as to the best means of calling the attention of member companies to the standards so far adopted and the advantages to be derived from their use on all new equipment. At the suggestion of Mr. Winsor it was decided to prepare a pamphlet containing all of the standards so far adopted by the association and send one of these pamphlets to each active member. To aid the committee in its work, it was also decided to send out, with these pamphlets, data sheets to be filled out and returned to the committee, showing the extent to which the association standards have been adopted, the advantages derived from their adoption or the objections to their use. The data sheet will also request information about local company standards which may be in use, and is to be accompanied by a letter signed by the president of the Engineering Association and the president of the American Association, calling attention to the value of standardization work.

The method of adopting standards by vote of members of the association was discussed at some length. A resolution was passed requesting the executive committee of the association to frame amendments to the by-laws providing for the adoption of standards by letter ballot only, the votes to be cast by properly accredited engineering officers of the member companies and approved by an executive officer of each company, the basis of representation to be one vote for each 1,000,000 car-miles or fraction thereof made by the member companies' cars during the last fiscal year preceding the casting of the vote.

The possibility of adopting further standards in the construction of gears and pinions was taken up with the representatives of the two manufacturing companies present. The standard distance between the center of the axle and the center of the armature shaft for motors of the same horse-power capacity was one point on which the members of the committee thought it might be possible to reach an agreement. Standard taper of armature pinions and standard locking devices for pinions were also referred to the manufacturers' representatives. Mr. Storer and Mr. Schermerhorn agreed on behalf of the companies which

they represented to investigate this point carefully, and advise the chairman of the committee at a later date whether it would be practicable to agree on standard dimensions.

At the meeting of the executive committee of the Engineering Association held last winter in New York the committee on standards was instructed to present to the convention this year specifications for wrought iron for brake rigging, specifications for axles and specifications for rubber-covered wire. The committee on standards decided to present to the committee next fall such data as could be obtained on existing specifications for wrought iron without recommendations for their adoption as standard. The subject of specifications for rubber-covered wire is to be included in the report of the committee on power transmission.

FREIGHT LOCOMOTIVES FOR THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD

The New York, New Haven & Hartford Railroad has placed an order with the Westinghouse Electric & Manufacturing Company for two freight locomotives to be employed on its main line. One of these locomotives is to be equipped with side rods and the other is to be of the geared type. It is understood that tests will be made with these locomotives to determine (1) the relative performance of electric and steam locomotives for freight service and (2) the relative advantages of the two types of locomotives which are to be employed.

So many conflicting reports have appeared in the technical and public press in regard to the proposed extension of the New Haven electrification that it may be well to give the facts. The performance of the present electrical system is very satisfactory, and the number of engine-miles per failure is far larger than with steam operation. During the month of May it amounted to 7345. The engineers of the company have made a very careful investigation as to the cost of electrifying the company's six-track Harlem River branch and the four tracks of the main line from Stamford to New Haven, inclusive of the necessary power houses, looking to the handling of passenger and freight trains. The investigation also covers the trackage incident to the electrification of freight and passenger yards. These estimates have been filed with the directors of the company, but no definite action has been taken by them looking to immediate extension of the system.

It is proposed, however, during the next few months to extend the present electrification from Stamford for the distance of one mile for experimental purposes. The overhead construction will differ somewhat in regard to the form of steel bents and arrangement of overhead wires from those previously used, but these changes are incident only to the improvements in forms of construction and reductions in cost. The main features of the present form of construction, including a steel contact wire suspended every 10 ft. by clips of the present design from an overhead copper conductor, will be retained.

EXHIBITS AT THE ATLANTIC CITY CONVENTION

The exhibition of railway appliances and machinery at the Atlantic City convention of the Master Car Builders' and Master Mechanics' Associations this week and last was held on Young's Million Dollar Pier. In point of size the exhibits exceeded all previous records; they covered 65,476 sq. ft. of floor space on the pier, and in addition a number of cars and locomotives were shown on the side tracks of the Philadelphia & Reading Railway. As in other years, the booths and decorations were of uniform design and effect. An especially large display of machine tools was made in Machinery Hall, on the south side of the pier. Among the exhibitors who furnish apparatus to electric railway companies were the following:

Adams & Westlake Company, Chicago, Ill., showed continuous basket racks with detachable bottoms; car trimmings; signal lamps and lanterns.

American Blower Company, Detroit, Mich., presented blowers for forges and furnaces; heating and ventilating apparatus for stations and shops; vertical enclosed self-oiling steam engines for electric lighting and pumping; Sirocco portable electric ventilating fans.

American Brake Shoe & Foundry Company, Mahwah, N. J., exhibited electric and steam steel-back brake shoes and reinforced extra durable high-friction brake shoes for all kinds of railway equipment; malleable-iron brake heads.

American Car & Foundry Company, New York, St. Louis and Chicago, had a reception booth only.

American Joxyl Company, New York, N. Y., showed car ceiling and panel decorations in wood.

American Mason Safety Tread Company, Boston, Mass., presented Mason safety treads; Empire treads; Karbolith composition floors for coaches and buildings.

American Steel Foundries, Chicago, Ill., exhibited a large number of bolsters, truck parts, roller bearings, Davis cast-steel wheels, etc.

American Tool Works Company, Cincinnati, Ohio, offered several of its machine tools, such as planers, lathes, drills and shapers, in connection with electric drive.

American Vanadium Company, Pittsburg, Pa., exhibited vanadium ores, alloys and steels; vanadium cast iron; vanadium brasses, bronzes and copper; also vanadium aluminum and other products.

Asbestos Protected Metal Company, Canton, Mass., showed headlinings and sheathing for steam and electric cars; controller box lining and general insulation; roofing and siding for railway structures.

Atha Steel Casting Company, Newark, N. J., exhibited Atha cast-steel body and truck bolsters and manganese steel railway motor gears and pinions.

Boker & Company, Herrmann, New York, N. Y., showed their Novo high-speed steel, various high-speed tools, etc.

Booth Company, L. M., New York, N. Y., operated a Booth water softener of 2500 gal. per hour purifying capacity.

Bowser & Company, Inc., S. F., Fort Wayne, Ind., exhibited oil storage systems complete; long distance self-measuring pumps; power pumps; automatic registering oil meters; oil storage tanks of all sizes and shapes, with pumps for handling and measuring all kinds of lubricating, paint and other oils, including gasolene, etc.

Brighton Brass & Bronze Company, Pittsburgh, Pa., presented journal bearings made of various mixtures and "Brighton" bearings.

Buffalo Brake-Beam Company, New York, N. Y., showed truss I-beams and special section brake-beams for all classes of equipment; also forged heads, fulcrums, chain clips and wheel guards.

Carnegie Steel Company, Pittsburg, Pa., showed Schoen steel wheels for steam and electric service. It also displayed Carnegie steel cross ties, fittings and new type rail sections; Duquesne rail joints; slack barrel kegs for spikes; track bolts, etc.

Chicago Car Heating Company, Chicago, Ill., presented vapor system of car heating with multiple regulation of heat; steam hose coupler, train-pipe valves, car heater specialties and Baker heater specialties.

Chicago Railway Equipment Company, Chicago, Ill., offered brake-beams of the Creco, Diamond, National Hollow, Kewanee, Reliance, Sterlingworth, Ninety-six and Monarch types; Monitor bolsters; Creco roller side bearings; Creco slack adjuster; Creco journal box and lid; Creco brake jaw; automatically adjustable brake heads.

Chicago Varnish Company, Chicago, Ill., displayed car sides with "Ce-Ve Process" of six-day painting on them.

Chisholm & Moore Manufacturing Company, Cleveland,

Ohio, had on hand one 30-ton chain hoist and trolley hoists of various sizes.

Chrome Steel Works, Chrome, N. J., showed steel car wheels with cast steel centers and forged tires, tires interlocking and keyed to center.

Cincinnati Bickford Tool Company, Cincinnati, Ohio, displayed several drills.

Cincinnati Planer Company, Cincinnati, Ohio, showed one 37 in. x 37 in. x 8-ft. forge planer with four heads and variable speed motor drive.

Clow & Sons, James B., Chicago, Ill., exhibited plumbing fixtures; steam, gas and water heating apparatus for railway buildings and cars; Eddy valves, hydrants; Jefferson unions and flanges; fountain brushes.

Coe Manufacturing Company, W. H., Providence, R. I., offered Coe's ribbon gold leaf and Coe's gilding wheels.

Commonwealth Steel Company, St. Louis, Mo., had aluminum models of car and locomotive underframes and bolsters.

Consolidated Car Heating Company, Albany, N. Y., exhibited quick-opening end valves, vapor and pressure steam heating systems, improved types of steam couplers and signaling system.

Consolidated Railway Electric Lighting & Equipment Company, New York, N. Y., showed its standard type "D" equipment of 4 kw capacity and its standard type "F" equipment of 2 kw capacity; also the Kennedy regulator.

Crane Company, Chicago, Ill., exhibited valves for superheated steam, steel valves and fittings for superheated steam, ferrosteel valves and fittings, pipe bends, steam separators, and also showed tilt steam traps in operation.

Curtain Supply Company, Chicago, Ill., displayed ring fixtures, Forsyth roller tip fixture, vestibule curtain handle and curtain materials of all kinds.

Damascus Brake Beam Company, Cleveland, Ohio, showed adjustable brake heads and forged steel fulcrums.

Davis-Bournonville Company, New York, N. Y., presented the Davis-Bournonville oxy-acetylene welding and cutting system and an oxygen generator and compressor.

Davis Solid Truss Brake Beam Company, Wilmington, Del., offered solid truss brake beams and solid steel back brake shoe.

Dearborn Drug & Chemical Works, Chicago, Ill., demonstrated their method of scientific treatment of boiler feed water.

Dixon Crucible Company, Joseph, Jersey City, N. J., showed silica-graphite paint for steel cars, lubricants and other graphite products.

Dressel Railway Lamp Works, New York, N. Y., made an extensive exhibit of car, track and station lamps.

Dudgeon, Richard, New York, N. Y., offered Universal jacks and test pumps in many forms, including car inspector's, railway, plain, base, claw, independent claw, horizontal and traversing jacks; electric power pump, and several types of hand-operated pressure pumps.

Duff Manufacturing Company, Pittsburgh, Pa., exhibited Barrett track and car jacks, "Duff-Bethlehem" forged steel hydraulic jacks, Duff ball-bearing screw jacks, journal jacks, geared ratchet jacks and wrecking jacks.

Duntley Manufacturing Company, Chicago, Ill., showed Duntley vacuum cleaners for passenger coaches and smaller vacuum cleaners for household purposes.

Edwards Company, O. M., Syracuse, N. Y., had an automatic steel trap-door for coach platforms, metal sash, car window fixtures, sash balances.

ELECTRIC RAILWAY JOURNAL, New York, N. Y., distributed copies of the ELECTRIC RAILWAY JOURNAL and engineering books.

Electric Storage Battery Company, Philadelphia, Pa., exhibited a complete line of storage batteries for car lighting, signals, etc.

Fairbanks, Morse & Company, Chicago, Ill., had two gasoline hand cars, one in the exhibit booth and one on the P. & R. tracks; Sheffield telescopic water column; Duff hydraulic jack of a new style; F. M. & Company tool grinder.

Flannery Bolt Company, Pittsburgh, Pa., exhibited Tate flexible staybolts and installation tools for applying same; "F. B. C." arch bar and continuous nut locks.

Forsyth Brothers Company, Chicago, Ill., displayed the Forsyth high capacity buffing device for passenger cars; radial draw-bar centering device; metallic window sash and safety deck sash rachets.

France Packing Company, Philadelphia, Pa., showed metallic and fibrous packings.

Franklin Manufacturing Company, Franklin, Pa., offered reinforced corrugated asbestos roofing or siding, asbestos century shingles, asbestos building lumber; Franklin rubber roofing; asbestos pipe coverings; papers, boards, packings and other asbestos railway supplies; wool and cotton waste.

Galena-Signal Oil Company, Franklin, Pa., entertained in its reception booth.

General Compressed Air & Vacuum Machinery Company, St. Louis, Mo., showed the Thurman portable electric vacuum cleaner.

General Electric Company, Schenectady, N. Y., exhibited one gasoline-electric car and maintained a reception booth.

General Railway Supply Company, Chicago, Ill., showed metallic (steel) sheathing; National steel trap-doors and lifting device; Schroyer friction curtain rollers and fixtures; Garland ventilators; the end of a vestibuled passenger coach equipped to show the application of Flexolith composition flooring; National vestibule curtain catches; National standard roofing; Imperial car window screens; Perfection sash balance and roller deck sash ratchet.

Gold Car Heating & Lighting Company, New York, N. Y., offered car heating and car lighting apparatus.

Goldschmidt Thermit Company, New York, N. Y., explained thermit methods for welding locomotive frames, driving wheel spokes, connecting rods and mud rings. It also showed metals manufactured by the aluminothermic process; samples of welds on pipes and wrought-iron and steel sections; thermit in cans for reviving dull iron in the ladle; Titanium thermit in cans for purifying iron and steel; welded rail joints and compromise joints.

Gould Coupler Company, New York, N. Y., displayed M. C. B. couplers; Gould malleable-iron journal boxes; Gould side-unlock coupler; Moritz M. C. B. coupler; Gould friction draft gears; Gould cast steel side frame; Gould cast-steel journal box; Gould special electric locomotive coupler; Hartman ball-bearing center plates and side bearings; special malleable-iron draft rigging and striking plates; frame with Gould body bolster, freight coupler, friction draft gear and steel draft frames; Gould draft gear, new passenger coupler, righting device and Gould vestibule.

Gray & Sons, Inc., Peter E., Cambridge, Mass., displayed lamps, lanterns and sheet metal specialties for every department of railway service.

Greene, Tweed & Company, New York, N. Y., offered Palmetto braided and twist packing; Palmetto air pump packing; Palmetto throttle valve packing; Manhattan packing; Favorite reversible ratchet wrench.

Grip Nut Company, Chicago, Ill., presented Grip nuts; Universal window fixtures; steel sash; Universal deck sash ratchets and car trimmings.

Hale & Kilburn Manufacturing Company, Philadelphia, Pa., exhibited car seats and seating of all kinds for standard railway cars; steel seats; steel interior finish, bulkheads and trim for all-steel cars; steel window sash and steel doors for all-steel cars.

Heywood Brothers & Wakefield Company, Wakefield, Mass., had car seats of various types.

Harrington, Edwin, Son & Company, Inc., Philadelphia, Pa., demonstrated the principles of geared and plain four-wheeled travelers, lower flange of I-beam; spur-geared hoist; improved screw hoist and differential hoist.

Home Rubber Company, Trenton, N. J., displayed black sheet packing; high and low-pressure diagonal rod packing; hydraulic packing; flax packing; gum core packing; ring and combination packings.

Illinois Malleable Iron Company, Chicago, Ill., offered brake shoes and unions.

Johns-Manville Company, H. W., New York, N. Y., exhibited asbestos packing, roofing, pipe covering, wick and rope packing, asbestos cement, hair felt; vulcabeston gaskets; joint washers and pump valves; magnesia covering.

Joliet Railway Supply Company, Joliet, Ill., showed 12 tested Huntoon brake beams; 24 new and old service tested Perry side bearings; one electric vacuum cleaner.

Joyce, Cridland Company, Dayton, Ohio, presented railway jacks.

Keller Manufacturing Company, Philadelphia, Pa., displayed vacuum cleaners.

Kerite Insulated Wire & Cable Company, New York, N.

Y., showed a section of Colon-Panama submarine cable, samples of aerial, underground and submarine cables, railway signal wire, sections of cables which have been in service from 30 to 40 years; Kerite tape.

Keystone Lantern Company, Philadelphia, Pa., exhibited the Casey standard railway hand-lantern.

Lackawanna Steel Company, New York, N. Y., made a display of rails, rail joints, tie plates, beams, channels, angles, steel plate, steel forging, corrugated and deformed bars, twisted squares, the Abbot base plate, sheet piling.

Linde Air Product Company, Buffalo, N. Y., offered its oxy-acetylene welding and oxy-coal gas cutting apparatus.

Link-Belt Company, Philadelphia, Pa., exhibited drive chains.

Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, presented one 24 in. x 12 ft. patent head motor-driven lathe, and one 18-in. x 8 ft. patent head motor-driven lathe.

Love Brake Shoe Company, Chicago, Ill., showed steel connector electric railway brake shoes and steel connector motor and coach shoes for elevated railway service.

Lupton's Sons Company, David, Philadelphia, Pa., displayed rolled steel skylight, rolled steel windows, hollow metal fire door and Pond operating device for pivoted sash.

Modoc Soap Company, Philadelphia, Pa., exhibited car cleaning soaps and similar material.

McConway & Torley Company, Pittsburgh, Pa., offered a wide variety of Pitt, Janney, Kelso and Buhoup couplers and the McConway steel-tired wheel.

MacLeod & Company, Walter, Cincinnati, Ohio, operated a model of a water softener and purifier. They also showed oil rivet forges, Buckeye heaters for repairing steel cars, the Buckeye light, and a new type of sand-blast machine.

McCord & Company, Chicago, Ill., exhibited freight and passenger journal boxes, draft gear and gaskets.

National Lock Washer Company, Newark, N. J., had car curtains, curtain fixtures, sash locks, sash balances, window fixtures, lock washers and nut locks.

National Malleable Casting Company, Cleveland, Ohio, displayed Tower, Climax and Sharon couplers.

National Railway Devices Company, Chicago, Ill., presented Schroyer uncoupling apparatus, Dohlin automatic car door fastener, Nichols car door fastener, Schoemaker firebox door operator, Turnbull driving-wheel flange lubricator and Rubbertex roofing.

National Tube Company, Pittsburgh, Pa., presented seamless tubes for mechanical purposes, Kewanee unions, valves and air pump unions.

New York Air Brake Company, New York, N. Y., had an exhibition rack, showing operation of latest improved brake equipment for locomotive, tender and passenger train of eight cars; also air signal equipment and the Forsythe automatic coupler.

Niles-Bement-Pond Company, New York, co-operated with the Pratt & Whitney Company in a display of the Pond rigid turret lathe, single screw tool clamp for Pond car wheel lathe, P. & W. 16-in. precision lathe for tool-room use, P. & W. high-speed twisted drills.

Norton Company, Worcester, Mass., had a large wall-case of Norton grinding wheels made of alundum and a case of India oil stones.

Norton Grinding Company, Worcester, Mass., showed a pair of car wheels illustrating a flat wheel and a wheel ground on a Norton car wheel grinder.

Pantasote Company, New York, N. Y., displayed Pantasote car curtains and upholstery materials, Agosote head linings, panels, partition, etc.

Pittsburgh Equipment Company, Pittsburgh, Pa., exhibited side frame, journal boxes, draft casting, body bolster and structural truck bolster.

Pressed Steel Car Company, Pittsburgh, Pa., confined itself to photographic reproductions of its products.

Railway Materials Company, Chicago, Ill., presented steel back brake shoes for car and electric service, Ferguson oil furnaces, Rymco journal boxes.

Ritter Folding Door Company, Cincinnati, Ohio, offered a model Ritter folding door, constructed of wood and glass, as used in machine shops.

Rubberset Brush Company, Newark, N. J., showed paint brushes set in rubber, adapted for railway use.

Russell, Burdsall & Ward Bolt & Nut Company, Port Chester, N. Y., exhibited finished and semi-finished castellated nuts, semi-finished hexagon nuts, finished case-hardened nuts, cold punched, chamfered and trimmed nuts, metal bolts and nuts.

Ryerson & Son, Joseph T., Chicago, Ill., displayed the Lennox rotary bevel shear, high-speed friction saw, boring bar, improved riveter, high-speed chain hoist and trolleys, valve seat facing machine, glyco-lined M. C. B. standard car journal bearings.

Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., presented open-hearth steel castings, consisting of body and truck bolsters, side truck frames, Excel couplers, engine frames, car and tender underframes, driving wheel centers and miscellaneous car and locomotive castings.

Scully Steel & Iron Company, Chicago, Ill., showed Everlasting blow-off valves, Simplex car and track jacks, homo-laminated staybolts, journal jacks, wrought-steel floor plate, hose couplings.

Spencer Turbine Cleaner Company, Hartford, Conn., showed suction machinery for cleaning carpets, car floors, etc.

Standard Steel Car Company, New York, N. Y., exhibited forged steel wheels.

Standard Steel Works Company, Philadelphia, Pa., had a reception booth only.

Sterling Steel Foundry Company, Pittsburgh, Pa., showed the Sterling automatic car coupler.

Strong, Carlisle & Hammond Company, Cleveland, showed samples of Randall's graphite sheet lubricator for railway motor and journal bearings.

Symington Company, T. H., Baltimore, Md., offered journal boxes, flexible dust guards and miscellaneous malleable iron castings.

Taylor Company, W. P., Buffalo, N. Y., showed the Taylor improved dust-proof self-locking journal boxes for freight and passenger service.

Topping Brothers, New York, N. Y., displayed the Burrows ball-bearing jacks and cone-bearing jacks.

Underwood & Company, H. B., Philadelphia, Pa., presented a portable cylinder boring bar, portable crank-pin returning machine, portable crank-pin rivet head facer, new vertical machine for boring small cylinders, such as air brakes, etc.

Union Fibre Company, Winona, Minn., displayed car lining, special fire and waterproof lining material for steel cars.

Union Spring & Manufacturing Company, Pittsburg, Pa., exhibited coil and elliptic springs, pressed steel journal box lids and spring plates, Kensington all-steel journal box.

U. S. Metal & Manufacturing Company, New York, N. Y., presented the Ideal automatic car coupler, Columbia lock nuts, Hutchins car roof, Detroit car door, Howard wrought-iron brake jaw, Western malleable-iron brake jaw, Hillman locked clevis and turnbuckle, Diamond tapered steel pole, St. Louis Surfacer & Paint Company's panels, an exhibition car equipped with Dunham hopper door device.

Watson-Stillman Company, New York, N. Y., showed hydraulic car wheel and crank-pin presses, hydraulic rail benders and jacks, turbine pumps.

West Disinfecting Company, Inc., New York, N. Y., displayed soap dispensers, disinfectants, disinfecting appliances for toilets and fumigating apparatus.

Westinghouse Automatic Air & Steam Coupler Company, St. Louis, Mo., showed a sample of its automatic air and steam coupler.

Westinghouse Air-Brake Company, Pittsburg, Pa., had a triple valve operative test rack, motor-driven air compressors, "hose protecting" couplings, annealed steel hose clamps, and made a demonstration of force required to separate hose couplings between cars as compared with standard hose couplings.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., showed various types of metallic filament and carbon lamps for car service.

Wheel Truing Brake-Shoe Company, Detroit, Mich., showed abrasive brake-shoes for truing up flat wheels, dressing down tread-worn tires and long flanges.

Wickes Boiler Company, Saginaw, Mich., presented the Wickes vertical water-tube safety steam boiler.

Yale & Towne Manufacturing Company, New York, N. Y., offered electric hoists, Triplex chain blocks, I-beam trolleys, electric triplex hoists, padlocks, door checks, night latches and builders' hardware.

News of Electric Railways

Program of A. S. & I. R. Claim Agents' Association

The executive committee of the American Street & Interurban Railway Claim Agents' Association has determined to eliminate the reading of set papers and the Question Box at the convention this year. Conforming to this decision, a program, as outlined below, has been prepared, and it is hoped and believed that the subjects selected will arouse a keen interest among members and provoke discussions that will be profitable to all. From two to four members have been requested to prepare written discussions of the various questions, and such discussions will be printed in advance and will be distributed to all the members immediately before the subjects are brought up. It is thought that in this way members will be better able to follow the discussion of the question in hand and that the arrangement will lead to a freer exchange of ideas than if the remarks were read from manuscript only.

PROGRAM.

1. What is the best means of preventing collision of cars and of cars with vehicles and pedestrians?
2. How can boarding and alighting accidents be diminished or prevented?
3. What is the best plan of having trainmen procure and report an increased number of witnesses to accidents?
4. Is it good practice, when statement of injured party is obtained of accident, to furnish him with copy of his statement? Would the effect be to lessen the tendency of plaintiff to deny his statement when testifying under oath? Is it good practice to furnish witnesses copies of statements at the time same are taken? What will be the results?
5. Is a school of instruction for trainmen essential? If so, in what departments should the instruction be given, and by whom?
   (*a*) As relating to new employees.
   (*b*) As relating to old employees.
6. Should information be furnished newspapers regarding the work of the claim department? If so,
   (*a*) By whom?
   (*b*) What subjects can be treated advantageously, beginning with the time of the occurrence of an accident; methods of handling; settlement; result of court trials; fraudulent claims?
7. What should be the relationship of the medical and claim departments? How can the medical best serve the claim department in the handling of accidents?
8. The claim department and its relation to the operating department:
   REASONS WHY IT SHOULD BE CLOSE:
   (*a*) The importance of all accidents being reported promptly to the claim department.
   (*b*) The importance of co-operation between the operating and the claim departments in all matters relating to accidents.
   (*c*) The opportunities afforded the claim department by learning the causes of many accidents and suggesting a remedy to the operating department for its consideration.
9. The unreported accident, its evil and remedy:
   CONDUCTORS FAIL TO REPORT ACCIDENTS BECAUSE:
   (*a*) They do not think it is necessary.
   (*b*) They do not want to take the time to make out the report.
   (*c*) Because the people say to the conductors they are not injured and the first heard from them is through an attorney or suit.
   THE EVIL:
   (*a*) The claim department is in the dark as to whether the claim is based upon a real accident or fake.
   (*b*) The difficulty of making proper investigation.
   (*c*) Lack of defence which enables the plaintiff to recover a verdict in cases which, if properly defended, might result in a verdict for the defendant.
   THE REMEDY:
   How to eliminate this character of accidents is a matter on which it is felt every claim department will be glad to hear a free and full discussion.

Data Sheets of A. S. & I. R. Engineering Association

The committee on way matters of the American Street & Interurban Railway Engineering Association has prepared data sheets Nos. 11a, 11b, 11c, covering the use of T-rail in paved streets, the use of open hearth steel for rails, the use of manganese steel for rails, the influence of increased width of gage on curves, the use of rail joints and economical maintenance and has sent them to member companies and associate members with the request that the questions be answered as fully as possible and the circulars returned to E. O. Ackerman, chairman of the committee on way matters of the association, in care of the Columbus Railway & Light Company, Columbus, Ohio. The questions on the data sheets follow:

RAIL FOR TRACK IN PAVED STREETS.

Data Sheet No. 11a.

1. Miles of track (on single-track basis).
2. Miles of track in city streets, paved.
3. Miles of track in city streets, unpaved.
4. Miles of T-rail track of modern construction in paved streets.
5. Miles of groove and half-groove rail track of modern construction in paved streets.
6. Give dimensions of wheel tread and flange used on cars operated on your tracks.
7. Rail section now being used for construction in paved city streets, giving length of time it has been used by your company with the reasons for its adoption and results obtained.

(*a*) Have vehicles been damaged in crossing or turning out from rails you have just described? (*b*) Is the rail described by your city engineer or highway officials as satisfactory for wagon traffic as any rail in use on your road? (*c*) Do heavily loaded wagons turn out from the flange-way along the rail now favored by you as easily or better than from rails formerly used?

8. (*a*) Give width of street pavement with single track. (*b*) Give width of street pavement with double track. (*c*) Give distance between inner gages of double track. (*d*) Give gage of track.
9. Give the extent of vehicular traffic, viz., estimated number per day of each of the following classes:
   (*a*) Automobiles and vehicles weighing one ton or under. (*b*) Wagons from one to three tons. (*c*) Wagons and trucks from three to five tons. (*d*) Wagons and trucks over five tons.
10. Kinds of paving and foundation (give approximate percentage of each kind and describe how it is installed with the rail).
11. Are you required to use the same kind of paving in the tracks as is used on the balance of the street?
12. (*a*) Is the T-rail track and paving satisfactory to your company? If not, why not? (*b*) Is the groove rail track and paving satisfactory to your company? If not, why not?
13. (*a*) Is the T-rail track and paving satisfactory to the authorities? If not, why not? (*b*) Is the groove rail track and paving satisfactory to the authorities? If not, why not?
14. Give the cost for maintenance of tracks:
   (*a*) Of your T-rail tracks. (*b*) Of trilby or girder rail tracks under similar conditions.
15. What portion of the paving are you required to maintain?
16. What is relative cost of maintenance of pavement on your approved T-rail track compared with:
   (*a*) Trilby or grooved girder rail? (*b*) Tram head girder rail?
17. What rail section do you recommend for use in paved streets under heavy vehicular traffic? Why?
18. What rail section do you recommend for use in paved streets in outlying residence districts where vehicular traffic is light? Why?
19. As to T-rail and groove rail, what argument have you against one and in favor of the other?
20. What type of paving do you consider best practice:
   (*a*) With T-rail track where vehicular traffic is heavy? (*b*) With T-rail track where vehicular traffic is light? (*c*) With groove rail where vehicular traffic is heavy? (*d*) With groove rail where vehicular traffic is light?
21. What height of rail do you consider best practice? Why?
22. Give details as far as convenient (with drawings if possible) of your modern track and roadway construction, including foundation and paving, and state what led to their adoption.

NOTE.—In addition to having questions 17 to 22 inclusive answered by your engineer or track superintendent, ask your city engineer to answer them and forward his answers to the chairman.

STEEL FOR RAILS.

OPEN-HEARTH RAIL.

Data Sheet No. 11b.

1. (*a*) Miles of open-hearth rail. (*b*) Rail section and when installed.
2. How does it wear in comparison with the Bessemer section?
3. Under what specifications was the rail obtained?
4. Have you a standard specification for open-hearth rail? If so, please forward it; if not, any suggestions on standard specifications for open-hearth rail will be pertinent.
5. Remarks.

MANGANESE RAIL.

1. Are you using any manganese rail outside of specials?
2. (*a*) What is the section? (*b*) Is it rolled manganese or cast manganese?
3. How long in use?
4. How does the life of the cast manganese compare with that of Bessemer or open hearth? (Give curve construction where rolled rail is used.)
5. Have you any suggestions to offer on standard specifications of manganese steel rails?
6. In what manner do you apply rail bonds to manganese steel rails?
7. Remarks.

GAGE OF CURVES.

Data Sheet No. 11c.

1. What is your practice as to the gage of curves of different radii?
2. Have you any figures or data on the effect on rolling equipment of the increasing of gage of tracks at curves?
3. What type of curve construction do you use and recommend in T-rail track?
4. What do you recommend as shortest radius for curves?
5. Give dimensions of wheel tread and flange used on cars operated around your curves.
6. Remarks.

RAIL JOINTS.

1. Give various types of joints you have in service and state the results obtained.
2. Give various types you have installed with your recent construction, with reason for adopting same.
3. What types do you recommend as best practice?
4. Remarks.

The committee on power generation of the association has prepared data sheet No. 12, on fuel gas analyzers, which it has addressed to members of the association with the request that the questions be answered and the circular returned to G. H. Kelsay, superintendent of power, Indiana Union Traction Company, Anderson, Ind., as soon as possible. The questions on the data sheet follow:

FLUE GAS ANALYZERS.

1. Have you a CO_2 recorder or flue gas analyzer?
2. What type of CO_2 recorder of flue gas analyzer?
3. How long have you been making flue gas analysis?
4. Do you employ hand firing?
5. What type of hand-fire grates do you use?
6. Do you use mechanical stokers?
7. What type of mechanical stokers do you use?
8. Do you find that there is any particular type of hand-fired grate or stoker with which it is easier to obtain a high percentage of CO_2 in the flue gases?
9. If you have obtained any increase in efficiency by the use of the CO_2 recorder, please state what per cent increase in efficiency you have obtained.
10. What kind of coal do you burn?

11. From what mines do you obtain your coal?
12. Do you make coal analysis? If so, what is the analysis (moisture, volatile, combustible, fixed carbon, ash) of the coal used?
13. What average per cent CO_2 do you usually obtain under the guidance of the CO_2 recorder?
14. What average per cent CO_2 did you find you obtained in your flue gases previous to being guided by the use of the recorder?
15. What maximum percentage of CO_2 should you obtain from the type of grate you use and the kind of coal you burn for the best economy?
16. Do you not think that the proper percentage of CO_2 to indicate best efficiency varies with different fuels?
17. Does the per cent of CO_2 vary with the rate at which you are working your furnaces? If so, please indicate through what ranges it varies and corresponding ranges of capacity of furnace.
18. Do you find your loss to be due to insufficient air, excess air, or lack of proper diffusion of air?
19. What changes in furnace construction, grate construction, arrangement of arches or baffling have you made to increase furnace or boiler efficiency?
20. Have you found that infiltration of air through the ordinary red brick boiler setting has been a material factor in the reduction of per cent of CO_2 obtained? If so, what steps have you taken to make your boiler walls impervious to air infiltration?
21. Have you made evaporation tests, checking evaporation and per cent of CO_2 and other gases? If so, please give us data showing results.
22. Where several furnaces discharge their gases into one stack, is it necessary to have a continuous record of the conditions of each furnace, or will not a record of the stack gases give all the information that is usually required?
23. Do you regard a draft gage an essential instrument in guiding one in obtaining best results in connection with the CO_2 recorder? If so, is it essential to have a recording gage?
24. Have you found that a decreased or increased draft has been required in your case to obtain higher furnace efficiency as indicated by the CO_2 recorder?
25. Have you found that automatic damper control produces more efficient results than hand damper control?
26. Have you found pyrometers or thermometers for taking flue gas temperatures essential auxiliaries in connection with flue gas analysis?
27. What relation have you found to exist between flue gas temperature and per cent of CO_2 in flue gases?
28. What is the form and location of gas collector in the flue which has been found the most satisfactory?
29. Do you analyze your flue gases for other gases than CO_2? If so, in what way has the additional information been of practical value?
30. How often do you find it necessary to check your recorder in order to make sure that it is accurate?
31. Has the maintenance and attention required to keep the CO_2 recorder in service and operating accurately been a material factor, and if so, what expense?
32. Do you find that such instruments as are now on the market have so far passed the stage of development as to be sufficiently reliable and accurate for all practical purposes?
33. Do you encourage attention on the part of boiler-room attendants by paying a bonus for good records made by the CO_2 recorder? If so, what is your schedule of rates?

Remarks.

Transit Affairs in New York

Arthur J. Baldwin, of counsel for the Bradley-Gaffney-Steers Company, addressed a letter to the Public Service Commission on June 18, giving in detail the proposition for the construction of a tri-borough subway route in place of the original proposal submitted by the company on March 18, 1909. The new proposition includes the building and operation of subways estimated to cost about $109,000,000. The various sections are given as follows:

Sec. 1. A route from the Battery through Church and Vesey Streets to Broadway, thence to Tenth Street and through private property to Irving Place, northward along Lexington Avenue and under the Harlem River to Mott Avenue and 149th Street; following substantially the lines of the Broadway-Lexington Avenue subway as planned by the commission.

Sec. 2. A route for two tracks in the so-called Brooklyn loop subway, now nearing completion, and also to and across the Manhattan and Williamsburg bridges.

Sec. 3. A two-track subway connecting the first two sections through Canal Street.

Sec. 4. Two tracks in a subway from the eastern terminal of the Manhattan Bridge along the Flatbush Avenue extension and Fulton Street to Ashland Place, being a portion of the Fourth Avenue subway laid out by the commission.

Sec. 5. A two-track subway along Fulton Street from Ashland Place to Lafayette Avenue, thence easterly along Lafayette Avenue to Reid Avenue and northerly to Broadway, Williamsburg, and westerly along Broadway to the Williamsburg Bridge.

Sec. 6. A two-track subway or elevated railroad northerly along Jerome Avenue in the Bronx, substantially as planned by the commission as a part of the Broadway-Lexington Avenue route.

Sec. 7. A two-track subway or elevated road easterly from Mott Avenue along 138th Street, as laid down by the commission.

Sec. 8. The Fourth Avenue subway, Brooklyn, from Ashland Place southerly, for which contracts have been awarded by the commission, but which have not been acted upon by the Board of Estimate.

The company proposes to build all of these lines without cost to the city, with the exception of the Brooklyn Loop Line Subway, now nearly completed, which has cost nearly $10,000,000, and the Fourth Avenue subway, the first six sections of which are to cost about $16,000,000.

Mr. Baldwin says: "The proceeds derived from the operation of such railroads, after deducting operating expenses, including maintenance of plant and equipment, payments to reserve and amortization funds, as provided in the grant, and equitable charge for the use of the Brooklyn Loop Line Subway and the Flatbush Avenue extension, and after payment of interest at the rate of 5 per cent upon the actual cost of construction of the other sections and of the equipment of said road, shall be divided, share and share alike between the company or its successors and the city, the company's rights in and to the railroad, unless sooner taken by the city, to cease at the end of the amortization period without compensation."

Cleveland Traction Situation

Since the holding of public meetings in furtherance of traction affairs in Cleveland has stopped matters have taken a political turn. Mayor Johnson made several addresses in his tent early last week, but later went East on an errand said to be connected with the work of financing the Schmidt franchises. Both Mayor Johnson and his associates, in these tent addresses, have taken for granted that they will be able to wrest the 3-cent lines from the Cleveland Railway by revoking the grants made to the Forest City Railway, the Low Fare Railway and the Neutral Street Railway. They have even stated that the Schmidt interests will control 80 per cent of the street railway lines after the expiration of the old franchises early next year.

On the evening of June 12 the City Council adopted resolutions giving notice that the franchises granted on 11 of the 3-cent routes will be revoked at the end of six months, under conditions in the ordinances, and further moves indicate that Mayor Johnson and his friends believe that a company will be organized to take over these lines and combine them with the new grants to Herman J. Schmidt. Should this program work out as arranged, the old company will still have a number of the most important lines and connecting roads in the city, to which transfers cannot be given. A long legal contest will, doubtless, result if the administration seeks to find a cause for revoking any of the franchises of the companies whose properties have been purchased. The statement by the Mayor that the company has not lived up to the gentlemen's agreement entered into between him and F. H. Goff does not carry much weight since Mr. Goff has stated publicly that he considered that the company carried out its part of the agreement in full.

Attorneys for Mr. Schmidt have been at work for several days preparing an ordinance granting Mr. Schmidt an extension of rights to all the streets on which the Cleveland Electric Railway's grants expire early next year. It seems to be the intention to have the Council pass this grant and to make all the other grants extensions.

About 45,000 people have signed the petitions for a referendum vote on the Schmidt franchise. The Chamber of Commerce will take part in the campaign. Robert E. McKisson, candidate for Mayor on the Republican ticket, will speak against the ordinances, but will urge a plan which he recommended when he was Mayor some years ago. He asserts that he will have a committee of 1000 men to work with him.

Herman J. Schmidt states that the projectors of the 3-cent fare lines will be financed in Cleveland, if possible, as it is the desire of all that they be owned by home people. He has also spoken about plans for taking over the stock of the Forest City Railway by exchanging stock of that company for stock of a new company.

Nothing new has developed relative to the subway franchise. The projectors of this plan have agreed to most of the changes desired by the Chamber of Commerce, with the exception of dividing it into two grants, one for the upper and the other for the lower level. Some of the business men of the city feel that the grant for the upper level will not be taken advantage of for building lines, but that it will be held to prevent other companies from doing so. This level would accommodate street cars only, while the low level may be used for an entrance for interurban cars and for steam roads as well.

Hearing on Boston, Lowell & Lawrence Electric Railroad

The Massachusetts Railroad Commission gave a hearing on June 14 upon the petition of the Boston, Lowell & Lawrence Electric Railroad for a certificate of public convenience and necessity granting the right to build a high-speed double-track electric interurban road equipped with the third rail between Boston, Lowell and Lawrence. The directors of the company are Paul Butler and Congressman Butler Ames, Lowell, Mass.; Spencer Borden, Jr., Fall River, Mass.; Oakes Ames, North Easton, Mass., and John T. Bur-

nett, Southboro, Mass. J. W. Farley, Boston, conducted the case for the petitioners. The Boston & Northern Street Railway was represented by Bentley W. Warren, counsel, and the Boston & Maine Railroad by William H. Coolidge.

Mr. Farley said that the object of the Boston, Lowell & Lawrence Electric Railroad is to provide fast service and short headway connections between Boston and the other terminal cities; the municipalities of Tewksbury, Wilmington, Woburn, Winchester and Arlington would receive improved service through its construction. The consulting engineers for the proposed line are Westinghouse, Church, Kerr & Company, New York.

W. Tucker, of Westinghouse, Church, Kerr & Company, said that the road will be built entirely upon its own right of way, with no grade crossings. Alternate routes have been selected, one running from Sullivan Square, Charlestown, by way of Arlington Centre, Winchester and Woburn, a distance of 24.3 miles, to Lowell, and 9.2 miles from Tewksbury Junction to Lawrence; and the other by way of Arlington Heights and Burlington to the same terminal points, a total distance of more than 30 miles. The first route has been selected as the more desirable. The estimated cost of construction by the first route is $7,065,700, as compared with $6,445,600 for the Arlington Heights and Burlington line.

The Boston terminal is to be located at the west of the present terminal station of the Boston Elevated Railway, with which direct connection is to be made by platforms and stairways. The terminal is to be built inside of and above the level of the present loop of the Boston Elevated Railway, with four stub tracks and the necessary platforms, waiting rooms, and ticket offices. Stairways will also connect with the street level. At Lowell the terminal will be located in the business district at the intersection of Central Street and Church Street. At Lawrence the terminal location is on South Broadway, near the business centre.

Mr. Tucker stated that the maximum grade is to be 2 per cent. The permanent roadway will be 28 ft. wide on embankments and 32 ft. wide in excavations, with subgrade 2 ft. below the top of the rail and gravel ballast. The ties will be 6 in. x 8 in. x 8 ft. long, with 85-lb. rails, 24-in. angle bar joints, 4 bolts per joint, with tie plates on all curves and bridge floors. The line will be equipped with automatic block signals of the home and distant type, with average block lengths of about 1 mile. All terminals, junctions and yards are to be equipped with interlocking towers. Power will be supplied from a plant located near the Shawsheen River and five substations. A fireproof car house and repair shop will be located near the power plant. A telephone line will be provided for the entire system. The third rail will of 100-lb. sections, and the track rail bonding will consist of two No. 4-0 bonds per joint. There will be 38 steel body passenger cars equipped with two 200-hp motors each, with forced motor ventilation, automatic air brakes and multiple unit control, two snow plows, one work car, six flat cars and six gondola cars for coal service. The estimated cost of the line follows:

ESTIMATED COST.

Cleaning and Grubbing	$ 17,400	
Grading	1,035,900	
Masonry	847,900	
Culverts	33,300	
Bridges and Trestles	595,600	
Track	643,600	
Fencing	81,700	
Block Signals	67,000	
Relocating Streets, Roads, Electric Line, etc.	25,700	
Supporting B. & M. Tracks	11,700	
Raising B. & M. Trestle, etc., Lowell	8,900	
Raising Lawrence Street, Lowell	52,500	
Boston Terminal	25,000	
Lowell Terminal	12,000	
Lawrence Terminal	8,000	
Stations (14)	10,000	
Power House	450,000	
Substations	190,500	
Transmission Lines	76,800	
Track Bonding	48,100	
Third Rail	377,600	
Car House and Shops	59,500	
Rolling Stock	564,600	
		$5,243,300
Construction Contingencies 5%	$ 262,200	262,200
		$5,505,500
Franchise, Legal Expenses, Engineering, Administration and Interest	605,600	605,600
		$6,111,100
Real Estate	954,600	954,600
Total	$7,065,700	$7,065,700

The company plans to make an express running time of 35 minutes, with one stop between Lowell and Sullivan Square, the express time to Lawrence from Sullivan Square being 40 minutes. Local trains will make a schedule speed of about 33 m.p.h. compared with 43 m.p.h. for the express runs. The single fare from Lowell to Sullivan Square will be 35 cents, 10-ride tickets being sold for $3 and 50-ride books for $12.50. From Lawrence to Sullivan Square these rates will be 40 cents, $3.50, and $15, and between Lowell and Lawrence, 30 cents, $1.80 and $7.50. The local fares are fixed on the mileage, based on the through rate units.

Philadelphia Rapid Transit Company Plans Improvements

The board of directors of the Philadelphia (Pa.) Rapid Transit Company met on June 21. Geo. H. Earle, Jr., reentered the directorate of the company as a representative of the city. Mayor Reyburn, of Philadelphia, was the only city director not in attendance. He is on his vacation.

The questions of extensions and improvements were considered, and improvements to the power station of the company at Thirty-third Street and Market Street were decided upon which will involve an outlay of $225,000. Among other things, the purchase of a 6000-kw Westinghouse exhaust steam turbine for this station was authorized, and $100,000 was appropriated for the foundation for an extension of the power house on North Delaware Avenue. It was reported at the meeting that track improvements completed since Jan. 1, 1909, had cost $875,000, much of which was spent for rebuilding and for special work at curves and crossings.

George H. Earle, Jr., Clarence Wolf, Jeremiah J. Sullivan, with John B. Parsons, president of the company, as a member ex officio, were appointed a committee to consider plans for publishing bulletins in the newspapers outlining the conduct and policy of the company. Mr. Earle was made chairman of this committee. The following resolutions were also adopted:

"Resolved, That in deference to the suggestion of City Councils the proper officers be, and are hereby, requested forthwith thoroughly to investigate and report to this board whether the company can properly perform all its obligations and duties to every one and at the same time accede to the request of Councils. And be it further

"Resolved, That said officers be requested to make such report as clear and succinct as is consistent with giving all the reasons and data necessary to justify and understand such conclusions as may be submitted to this board."

"Resolved, That the officers be requested to consider and report upon the practicability of arranging that the employees of the company shall be given participation in its net earnings, in order that, if possible, the adjustment of wages may be made automatic and not a possible subject of contention, and so that each employee may hereafter have as direct an interest in the company's well-being as any owner of its securities."

On June 22 the Supreme Court dismissed the suit instituted by the committee of fifteen to enjoin the company from refusing to sell six tickets for 25 cents and denied City Solicitor Gendel the privilege of filing a petition which was intended to make the municipality a party to the proceedings. Chief Justice Mitchell said that the usual practice is for such matters to be taken to the Court of Common Pleas and then, if necessary, through that channel to the Supreme Court. Mr. Gendell immediately filed the same bill in equity in the Court of Common Pleas, No. 2, which he had prepared for the Supreme Court.

Appraisals of Franchises to be Discussed at Lake George

E. S. Fassett, president of the Street Railway Association of the State of New York, has announced that one of the features of the meeting of the association at Lake George on June 29 will be an address by Ralph R. Rumery, expert appraiser of the State Board of Tax Commissioners. Mr. Rumery has had charge of the appraisals of many of the public utility corporations in the State for several years, and in his address will describe the methods used by the board in these appraisals. His presence at and participation in the meeting indicate a desire on the part of the tax commission that the companies shall be conversant with its policy of franchise appraisals. The address will form part of the proceedings of Tuesday afternoon, June 29. The invitation extended by Mr. Fassett to Mr. Rumery to present this address was not accepted in time to permit an announcement of the fact on the printed program which was published on page 1094 of the ELECTRIC RAILWAY JOURNAL of June 12, 1909.

Electric Railway Opened at Manhattan, Kan.—The Manhattan City & Interurban Railway has opened its line in Manhattan.

Extraordinary Session of Supreme Court to Consider Franchise Taxes.—Under authority of a law enacted by the last Legislature designed to bring to early trial actions pending for the review of unpaid special franchise taxes, involving about $41,000,000 in New York State, Attorney-General O'Malley has announced that upon his application the Governor has appointed an extraordinary term of the

Supreme Court to convene in Erie County July 12 for the purpose of hearing special franchise matters in the Eighth Judicial District. The new law provides for the trial of these actions before extraordinary terms of the Supreme Court instead of before referees.

Consideration of Creation of Public Service Commission in Maryland Postponed.—The cabinet of Governor Crother of Maryland was to have met in Baltimore on June 17 to consider the question of creating a public service commission. S. Davies Warfield, chairman of the executive committee of the Consolidated Gas, Electric Light & Power Company, Baltimore, desires to explain to the cabinet a proposition to bring natural gas into Baltimore from West Virginia, and the meeting has been postponed until June 28, when it is expected that Mr. Warfield will set forth this plan in detail. Mr. Warfield, it is said, desires to enter into an agreement with the City of Baltimore direct, proposing that the city be adequately represented on the board of directors of the company, in which event he is said to feel that the company should not be subject to a State governing body. The Governor is reported to have said that he thinks it would be advisable to consult with the representatives of public service corporations, draft a law such as the company desires and then submit it to the cabinet for consideration.

Circular on Exhibit at Denver.—John A. Beeler, vice-president and general manager of the Denver (Col.) City Tramway, has issued a cordial invitation to manufacturers of electric railway apparatus to exhibit at the Denver convention next October. Mr. Beeler's letter, which has been sent to a number of supply houses, follows: "The annual convention of the American Street & Interurban Railway Association will be held in Denver, and I am the committeeman for this district upon whom rests a part of the responsibility of making it a success. As this is the first time that the association has met so far west, all Western men, and I especially, are deeply interested in proving that no mistake has been made in choosing Denver for the meeting. There surely will be a new field opened by this convention that is worthy of attention of the American Street Railway Manufacturers' Association and of all material men, and my object in writing you is to call this fact to your attention and also to express my personal wish that you send not only an exhibit, but such representatives as the importance of your line requires. To secure space address K. D. Hequembourg, vice-president American Street Railway Manufacturers' Association, in charge of exhibits, Dunkirk, N. Y."

San Francisco Jury Disagrees.—The case of Patrick Calhoun, president of the United Railroads of San Francisco, accused of bribery in connection with the granting of franchises to his company by the City Council, was submitted to the jury shortly before noon on June 19, and at noon on June 20 the order for dismissal of the jury was made by Judge Lawlor with the consent of the prosecution and the defense, each juror having pronounced the prospect of a verdict as hopeless. The jury stood 10 for acquittal and two for conviction. The trial was begun in February, and was marked by a sensational rifling of the offices of the company on March 26 and 27 by the police on a search warrant. Further raids of this kind, however, were stopped by an injunction obtained by the company to protect its property. The typewritten record of the case amounted to 2,500,000 words when the jury was completed. Judge, attorneys and witnesses have added another 1,750,000 words to the bulky transcript since that time, making a total of 4,250,000 words.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—It is more than likely that the Legislature will adjourn on July 15. A resolution to this effect was introduced in the House on June 16, and was passed and ordered to be transmitted to the Senate. Later a motion was made to reconsider the matter as it was feared by some members that the work of the Senate might be hampered under the circumstances, but this motion was lost as was also a motion to reconsider transmitting the resolution of the adjournment to the Senate. By some the hope is expressed that the public utilities matter may be still further delayed so that action on it will be impossible before adjournment. On the other hand, there are interests that feel that the matter had better be settled now, as it is likely to come up again next year with another period of attending uncertainty. One thing is certain, nothing has been stated by any of the members of the committee that would indicate the disposition to be made of the matter. The legislative committee of the State Business Men's Association recently sent a letter to the newspapers of the State in which many questions were propounded that have caused considerable editorial comment. The hearings on the measure were concluded on June 15, but the testimony did not add materially to the volume of information before the committee.

Financial and Corporate

New York Stock and Money Market

June 22, 1909.

After a week of liquidation and price reaction, the New York stock market to-day showed some symptoms of recovery. Trading was only moderately heavy, but all of the more active issues recorded fractional gains. While there has been no distinctive bear campaign, during the past week there has been more or less of selling pressure mostly from those who accumulated shares at lower levels and were seeking profits. The failure of the plan to list Steel common in Paris and the exaggerated reports of Mr. Harriman's illness were both depressing influences. Traction stocks were less active than earlier in the month, but price changes were insignificant.

The demand for bonds is a trifle less insistent but is still very good. Money continues to be easy at cheap rates. Quotations to-day were: Call, 1½ to 2 per cent; 90 days, 2¼ to 2¾ per cent.

Other Markets

Philadelphia Rapid Transit recorded a small advance. Union Traction, also, on more moderate sales, has slightly improved in price.

In Boston, a few lots of Elevated have been sold and some blocks of both issues of Massachusetts Electric, but changes in prices have been insignificant, although the general tendency has been upward.

No interest has been shown in the Chicago market in tractions. Chicago Railways has been practically out of the trading. Kansas City Railway & Light has been occasionally offered for sale, the price ranging from 49 to 50.

In the Baltimore market, United Railway bonds, the only traction security that has been of interest for many months, have been less active. Quotations are practically unchanged.

At the auction of securities in New York last week the following tractions were sold: $300 Jackson (Mich.) Consolidated Traction Company 5 per cent gold bonds, $100 each, at 90; $5,000 Albany & Hudson Railroad Company 5 per cent bonds, at 38.

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

	June 15.	June 22.
American Railways Company	a46	a45¾
Aurora, Elgin & Chicago Railroad (common)	a41	a43
Aurora, Elgin & Chicago Railroad (preferred)	a88	a88
Boston Elevated Railway	129	128
Boston & Suburban Electric Companies	*16	*16
Boston & Suburban Electric Companies (preferred)	*70	*71
Bos ton & Worcester Electric Companies (common)	10	10
Boston & Worcester Electric Companies (preferred)	54	a56
Brooklyn Rapid Transit Company	79¼	77⅞
Brooklyn Rapid Transit Company, 1st ref. conv. 4s	87½	86¾
Capital Traction Company, Washington	*134	a134½
Chicago City Railway	a190	a190
Chicago & Oak Park Elevated Railroad (common)	*4	*4
Chicago & Oak Park Elevated Railroad (preferred)	*14	*14
Chicago Railways, ptcptg, ctf. 1	a107	a109
Chicago Railways, ptcptg. ctf. 2	a37	a36¾
Chicago Railways, ptcptg. ctf. 3	a26½	a28
Chicago Railways, ptcptg. ctf. 4s	a10	a10
Cleveland Electric Railway	*78	*78
Consolidated Traction Company of New Jersey	a78	a78½
Consolidated Trac. Co. of N. J. 5 per cent bonds	a106⅛	106¼
Detroit United Railway	61⅝	a62⅜
General Electric Company	161	160
Georgia Railway & Electric Company (common)	91	a93
Georgia Railway & Electric Company (preferred)	*85	88
Interborough-Metropolitan Company (common)	17⅛	16⅞
Interborough-Metropolitan Company (preferred)	48⅝	45⅜
Interborough-Metropolitan Company (4½s)	79⅛	78¼
Kansas City Railway & Light Company (common)	49⅝	a49
Kansas City Railway & Light Company (preferred)	a86	a84¾
Manhattan Railway	a148	143⅞
Massachusetts Electric Companies (common)	12¼	a12½
Massachusetts Electric Companies (preferred)	68	a68
Metropolitan West Side, Chicago (common)	a18	a17
Metropolitan West Side, Chicago (preferred)	a53	a52
Metropolitan Street Railway	29	a27
Milwaukee Electric Railway & Light (preferred)	*110	*110
North American Company	85¼	83¼
Northwestern Elevated Railroad (common)	a24	a23
Northwestern Elevated Railroad (preferred)	a69½	a69½
Philadelphia Company, Pittsburg (common)	a42½	42½
Philadelphia Company, Pittsburg (preferred)	a43¾	a44
Philadelphia Rapid Transit Company	a27¾	29¼
Philadelphia Traction Company	a91½	91
Public Service Corporation, 5 per cent col. notes	a100½	a100½
Public Service Corporation, ctfs.	a89¼	a89
Seattle Electric Company (common)	*112½	*109
Seattle Electric Company (preferred)	103	102
South Side Elevated Railroad, Chicago	a55	a55½
Toledo Railways & Light Company	a9	a9
Third Avenue Railroad, New York	27½	26¼
Twin City Rapid Transit, Minneapolis (common)	105	104¼
Union Traction Company, Philadelphia	a53⅛	53⅛
United Railways & Electric Company, Baltimore	a12¼	a11¾
United Railways Inv. Co., San Francisco (common)	37½	38¾
United Railways Inv. Co., San Francisco (preferred)	a56	a62
Washington Railway & Electric Company (common)	a43½	a43
Washington Railway & Electric Company (preferred)	a91	a90⅝
West End Street Railway, Boston (common)	92	92
West End Street Railway, Boston (preferred)	*107	105¼
Westinghouse Electric & Manufacturing Company	85	83¼
Westinghouse Elec. & Mfg. Company, (1st pref.)	*124	a124

aAsked. *Last sale.

Causes Ascribed for Failure of Metropolitan Street Railway to Meet Obligations

Edwin S. Marston, Edwin M. Bulkley, John W. Castles, Dumont Clarke, R. Y. Hebden and Otto H. Kohn, comprising the committee representing the $16,604,000 of 4 per cent bonds of the Metropolitan Street Railway, New York, have issued a circular to the holders of these securities in which the statement is made that under existing conditions the earning power of the properties, as ascertained by a careful and exhaustive analysis, is not sufficient to pay any fixed return on either the $12,500,000 of 5 per cent bonds or the $16,604,000 of 4 per cent bonds of the company. The causes which they ascribe to this failure follow:

THE TRANSFER SYSTEM

"The theory upon which the surface railway companies accepted the transfer system imposed by the Legislature as a condition to the making of certain mergers and leases has proved to be a fallacy and a mistake of judgment. A fixed fare of 5 cents will compensate for carrying a passenger for a certain distance, precisely as any given sum will compensate a certain amount of labor or purchase a certain amount of merchandise. When the laborer or merchant is compelled to furnish labor or merchandise at less than the value or cost thereof, starvation or bankruptcy is inevitable. The purchasing power, i. e., the actual value, of 5 cents to-day is admittedly considerably less than it was 10 years ago, while the cost of all the items which enter into the service rendered for 5 cents by the street railways has largely increased. The great amounts necessary to construct the property, the constantly increasing cost of the items entering into the charges for its operation and maintenance, and the burdens imposed by the public authorities, have combined to demonstrate that the carrying of passengers not only for an unlimited distance on a continuous line, but also with the privilege of obtaining transfers from one line to another (in some instances to a practically indefinite extent), is impossible to be continued without a great and constantly growing loss. The practical reduction of the fare to about 3 cents per passenger has been imposed by the transfer system, in the face of the fact that the cost of the construction of street surface electric lines in the Borough of Manhattan (where the use of the underground electric system is required) is several times greater per mile than in any other city or in the other boroughs in New York, to say nothing of the enormous increase in the cost of operation and maintenance due to the annually increasing congestion of vehicular traffic in the principal thoroughfares.

"The reasons why such a result cannot be fairly insisted on by the public have never been more clearly presented than in the memorable message of Governor Hughes accompanying his veto of the bill which fixed a rate of 2 cents per mile for the transportation of passengers by steam railroad companies.

"In the present instance, the resulting disaster is emphasized by the gross abuses which have grown up in the practical workings of the transfer system and the consequent additional loss.

"The solution of the problem and the remedy for the wrong rest with the public authorities.

EXCESSIVE TAXATION

"Under laws passed upon the theory that this property produced large profits in addition to a fair return on the actual investment, and therefore merely from the company's utilization of franchise rights (an impression, the existence of which, it must be said, is chargeable in part at least to those formerly in control of the company), it is now claimed by the taxing officers that more than 35 per cent, and probably more than 40 per cent, of its net earnings (before paying any interest or other return on the cash actually expended in constructing and equipping the property), must be paid, annually, by way of special franchise taxes and other public charges. That this is confiscation, pure and simple, is self-evident. That no business can carry such a burden is clear. Here, too, a readjustment at the hands of the public authorities is imperatively necessary.

"The net result of the matters mentioned in the above paragraphs may justly be thus summarized:

"During the last 15 years, the fare per passenger carried has been reduced from 5 cents to an average of practically 3 cents, namely, nearly 40 per cent, while in less than 10 years the burden of taxation has been increased fully 100 per cent.

LEASED LINES

"In creating and enlarging the Metropolitan system, the policy was adopted of taking over certain lines on long-time leases under which the company undertook to pay certain rentals or guaranteed dividends (in many instances at an exceedingly large rate) to the lessors or to their stockholders. Careful and laborious examination, practical tests, tabulations and study, have resulted in demonstrating, conclusively, that, separately operated under existing conditions, not one of the leased lines produces an income sufficient to pay its operating expenses and taxes, and yield a return equal to the amounts specified in the lease thereof. The catastrophe which has overtaken the Metropolitan system is a general one. It affects as well its leased lines and the holders of the securities representing their properties; in some cases, the effect on the leased lines involved is even more disastrous. In most instances, the contribution of a leased line to the combined gross earnings of the system as a whole is greatly less than the cost of operating and maintaining its properties. A readjustment of relations with the leased lines, or with such of them as it may be deemed wise to continue to keep in the system, is therefore essential to a proper and stable solution of the problem.

MISCELLANEOUS CONSIDERATIONS

"The most important of these is the necessity for the raising of a large sum of new money for the general rehabilitation of the system and the acquisition of new cars, and of adopting the conservative policy of applying large portions of current earnings to defraying the necessary maintenance and depreciation charges. The present demands for these purposes may, in a large measure, be justly ascribed to the failure of the New York City Railway to make adequate expenditures and reserves in respect of such matters.

"A proper reorganization must not only be based on sound principles of a financial and administrative character, but must also develop a management which will conform thereto, and particularly one which will apply and enforce these principles in the operation and conservation of the property, thereby remedying the faults of the past and giving assurance against their recurrence.

"As it will be perceived, the situation is far from satisfactory. The committee believes that it is due to the bondholders whom they represent that the facts should be plainly stated and generally understood. They concern not only the security-holders but the general public as well. A readjustment of relations is essential in the interest of all. Street car transportation is a public necessity. The extent and character of the service rendered are necessarily limited by the ability and means of the company to provide the same.

"The committee is prepared to support any proposition which will promptly accomplish normal and just relations between all concerned in the welfare and proper operation of the lines which it may be determined to include in the reorganized system. Such relations must necessarily be worked out by means of a readjustment based on changed conditions, and in the light of the lessons taught by past fallacies and erroneous policies, and grounded upon propositions which are inherently and practically just and equitable, to the public, the city, and the company alike.

"While the considerations above stated are of more or less general application, they are of graver and more pronounced importance in the case of the Metropolitan system than in the case of any other lines in Greater New York, for the following reasons:

"(a) The traffic in the streets occupied by the principal Metropolitan lines is more congested than in any other part of the city, thereby resulting in burdens not shared by lines operated in less congested streets;

"(b) The Metropolitan system is built up more than any other system in Greater New York upon leases and mergers, by reason of which the law imposes the transfer obligation—the Third Avenue system, for instance, has no leases, and, so far as the Borough of Manhattan is concerned, is practically free from compulsory transfers; and

"(c) The existence of the leases above referred to very materially increases the taxes and losses of the system.

"After most careful study and thought the conviction is forced upon your committee that a reorganization which shall be more than a mere temporary makeshift leading before long to a renewed collapse, but which shall provide a sufficient amount of new capital, be fair and reasonable to the community at large and the legitimate claims of security-holders, and safeguard with a reasonable degree of assurance against disaster in the future, cannot be effected unless and until a change shall have been brought about in the fundamental points which we have enumerated, and at least two of which depend for their correction upon appropriate action by the public authorities. If such action is not had, your committee may be called upon to face and to present to you the question whether under such circumstances, it will not be the wisest course and one which in the end will involve a minimum of financial sacrifice on your part, to take title to and possession of those properties (real estate and others) especially pledged

as security for your bonds, and to convert the same into cash for your benefit—a course of action which with due consideration for your interests and even more for those of the public, should be resorted to only as a last resource, inasmuch as it would mean a total disorganization, if not actual disruption, of the street railway system and service in much the greater part of New York City."

Annual Report of the South Side Elevated Railroad

Gross earnings of the South Side Elevated Railroad of Chicago in the year 1908 were $2,241,690, as compared with $2,105,193 in the preceding year, or an increase of 6.48 per cent. Operating expenses, including loop rental and taxes, were equal to 70.1 per cent of gross earnings, as compared with 69.3 per cent in 1907. The following table shows the earnings for three years:

	1908	1907	1906
Gross Earnings	$2,241,690	$2,105,193	$1,788,975
Operating Expenses and Taxes	1,571,066	1,459,746	1,207,269
Net Earnings	$ 670,624	$ 645,447	$ 581,706
Interest and Rentals	436,620	205,939	33,750
Net Divisible Income	$ 234,004	$ 439,508	$ 547,956
Dividends	76,723	409,187	409,177
Surplus	$ 157,281	$ 30,321	$ 138,779

Of the total of $1,571,066 shown as operating expenses, $758,106, or 33.8 per cent of gross earnings, was required for conducting transportation. This compares with a corresponding expenditure equal to 32.2 per cent in the previous year. There was expended on maintenance of way and structure in 1908 a total of $128,588, or 5.7 per cent of gross earnings. On maintenance of equipment there was expended $178,605, or 7.9 per cent. This indicates a total expenditure on maintenance of 13.6 per cent of the gross earnings.

Charles V. Weston, the president, in the address presented to stockholders at the time of the annual meeting, said in part:

"During the months of August, September, October and November, 1908, the volume of traffic was less than for the corresponding months of the year 1907. The other eight months of the last year showed increases in traffic over corresponding months of the previous year, ranging from 21.96 per cent to 2.17 per cent, the net increase for the year over the total number of paying passengers carried in 1907 being 6.32 per cent.

"The low point in the traffic for 1908 was reached in February, when the daily average number of passengers transported was 111,927. The highest number of passengers carried for one month during last year came in June, when the daily average was 125,876 passengers, or 749 passengers less per day than were carried during the month of October, 1907, when the average per day reached 126,670 passengers, the highest daily average in any month of that year.

"The lower rate of increase in net earnings, compared with the increase in gross earnings, is due to the fact that the unavoidable increase in the operating expenses, on account of operating additional lines, was proportionately greater than the increase in revenue, for the following reasons: The general business recession, and more vigorous competition from parallel lines of transportation. To meet the competitive service installed by other companies in the territory tributary to your road, it was necessary last year to operate car mileage greater in proportion to the traffic received than has been heretofore necessary.

"There were increased expenses coming from other sources than conducting transportation on additional road.

"The stock yards branch of your railroad was opened to traffic on April 8, 1908. The business developed on that line during the first nine months of operation indicates that the time is not far away when it will become a profitable piece of railroad. The operation of the extensions to your railroad, considered as a whole, verifies the wisdom of your directors in undertaking the projection of these branch lines into territory which had been sufficiently developed to insure—from the beginning—some surplus earnings over operating expenses, maintenance costs and fixed charges.

"The physical property of your company has been maintained in the very best condition of repair and efficiency. A larger amount of renewals of track timbers has been made during the last fiscal year than was done during any previous year.

"Your rolling stock is in first-class condition. The electrical equipment on the cars, as a whole, is in better condition than it has been for several years, for the reason that many of the original motors, which had been in service for nine years, were showing signs of failure, and on a large proportion of the equipment, the commutators, armatures and fields have been renewed, in such manner that the machines are in equally good or better condition for service than when they were first installed. All the cost of renewing these equipments has been charged into operating expenses. The work of renewing the equipments which are showing signs of failure will be continued this year until all have been made good.

"During the last year some progress has been made in respect to the lengthening of platforms at loop stations. Civic associations investigated the question of loop platform extensions, with a view to arriving at an impartial judgment of the matter. Discussion of the question of platform extensions involved the question of increasing the length of haul on the elevated railroads, for the same rate of fare now charged. Your directors and your president recognized that any increase in the average distance of haul per passenger carried over that which is being done now on the elevated lines, for a flat rate of five cents, would result in serious loss to the companies, and representations bringing out that fact were made to the local transportation committee by your president.

"The average haul distance on the South Side Elevated Railroad to-day, including one-half the circuit of the loop, is 6.6 miles. The average cost of hauling a passenger is 3½ cents, leaving 1½ cents per passenger to pay fixed charges, depreciation, renewals and fair return on the actual investment in the property. These figures, in respect to the cost of the service and net revenue per passenger carried, apply to all the elevated railroads in this city.

"All new construction of the third track and branch lines authorized has been completed, and these are now in full operation. The cost of the new construction has been just within the amount realized from the sale of the bonds issued for that purpose.

"It is the opinion of your present directors that the physical property, in its present condition, could not be replaced for the amount of the stock and bond issue. Your company has no floating debt, or other indebtedness, except current expenses. It is discounting its bills, and had $343,109 cash on hand on Dec. 31, 1908.

"As I see it, the crisis in the affairs of your company has been passed, and although we may not reasonably hope for any sudden or extraordinary expansion of traffic, it is entirely consistent to predict a steady and continuous growth of business which will ultimately place the property on a good paying basis, provided that entanglements which will put additional burdens upon it without adequate compensation are avoided."

The published statement contains the following:

"Between 1908 and Dec. 31, 1907, $420,541 was eliminated from the cost of property; in January, 1908, $50,000 additional was eliminated, making a total amount of $470,541 taken away from the cost of property, on account of depreciation, to and including January, 1908. This amount is now charged to cost of property and credited to a depreciation reserve, less $279,859, being the amount of property replaced or disappeared, leaving a balance in depreciation reserve of $190,682, to which has been added $50,000, set aside for depreciation and deducted from reserve account in 1908, making a total depreciation reserve of $240,682."

Report of Chicago Railways Company for April and Three Months

The Chicago (Ill.) Railways Company reports earnings as follows for April, 1909, and the three months ended April 30, 1909:

April:	1909.	1908.
Gross receipts	$997,348	$865,435
Expenses and taxes	665,258	626,333
Balance (actual)	$332,090	$239,102
Balance (30 per cent of gross)	299,204	259,630
Interest (5 per cent on value of property)	171,522	136,492
Net income	$127,682	$123,138
Division:		
City's, 55 per cent	$70,225	$67,726
Chicago Railways', 45 per cent	57,457	55,412
Three months:		
Gross receipts	$2,853,956	$2,481,993
Expenses and taxes	1,980,416	1,799,478
Balance (actual)	$873,580	$682,525
Thirty per cent balance	856,199	744,633
Five per cent interest return	500,363	408,345
Net income	$355,836	$336,288
City, 55 per cent	195,710	184,958
Company, 45 per cent	160,126	151,330

American Cities Railway & Light Company, New York, N. Y.—At a meeting of the board of directors of the American Cities Railway & Light Company, held on June 17, the regular quarterly dividend of 1½ per cent was declared on the preferred stock and a dividend of 1 per cent was declared on the common stock, both payable on July 1, 1909,

to stockholders of record on June 21, 1909. The dividend on the common stock is the initial dividend. It is understood that the earnings of the properties controlled by the company are showing a very satisfactory increase over last year.

Boston & Northern Street Railway, Boston, Mass.—The Railroad Commission has granted the Boston & Northern Street Railway permission to issue coupon or registered bonds at par value not to exceed $536,000, payable 50 years from date and bearing interest at the rate of 4 per cent, as necessary for meeting the cost of additions and improvements.

Central Pennsylvania Traction Company, Harrisburg, Pa.—At a meeting of the stockholders of the Central Pennsylvania Traction Company recently, it was voted to issue $300,000 in bonds for the purpose of securing funds to carry out a number of improvements to the property which have been under consideration for some time.

Chicago (Ill.) Railways Company.—N. W. Harris & Company, New York, and the National City Bank, New York, have purchased $5,000,000 of first mortgage 5 per cent rehabilitation bonds of the Chicago Railways Company and are offering the same for public subscription. The new issue increases the total issue of bonds to $19,000,000. The advertisement offering the bonds for subscription contains the report of the company for the year ended Jan. 31, 1909, and a statement giving the financial liabilities of the company. A feature of the advertisement is the statement that the bonds are in the nature of a quasi-municipal security.

Connecticut Valley Street Railway, Greenfield, Mass.—The Connecticut Valley Street Railway has petitioned the Railroad Commission for authority to issue stock to the amount of $750,000 for refunding its funded debt and meeting other obligations in connection with the purchase of physical plant and franchises.

Dayton & Xenia Traction Company, Dayton, Ohio.—T. A. Ferneding, Edward Canby and John Vogeler, as a committee of reorganization, purchased the property of the Dayton & Xenia Traction Company recently at special master's sale for $580,000.

Denton Interurban Railway & Power Company, Denton, Tex.—The property of the Denton Interurban Railway & Power Company will be sold under foreclosure at Denton on July 6, 1909. The property was inventoried in court at $51,652, and the vendor's lien notes were listed at $50,822. Those who desire to bid should address E. F. Bates, Denton, the receiver of the company.

Gainesville Railway & Power Company, Gainesville, Ga.—The Gainesville Railway & Power Company has been organized to succeed the Gainesville Electric Railway, the property of which was sold recently under foreclosure. The new company will have an authorized capital stock of $150,000 and will authorize $150,000 bonds, and will issue $125,000 of each, reserving the remainder for future requirements. A. G. Sharp, Atlanta, will be elected president of the company, and W. H. Slack will be secretary and treasurer.

Havana (Cuba) Electric Railway.—The directors of the Havana Electric Railway Company have under consideration a plan to retire the $5,000,000 of 6 per cent preferred stock of the company and replace it with an issue of bonds. In addition to the preferred stock there is $7,500,000 of common stock outstanding.

Interborough Rapid Transit Company, New York, N. Y.—Application was made to the Public Service Commission of the First District of New York on June 17 by the Interborough Rapid Transit Company for authority to issue $10,000,000 bonds under the $55,000,000 mortgage of 1908 in order to retire the $10,000,000 of three-year 5 per cent gold notes of 1907 due on March 1, 1910. Of the $55,000,000 issue of bonds, $30,000,000 were deposited to secure $25,000,000 of three-year 6 per cent notes of 1908, due on May 1, 1911, of which $23,424,000 was outstanding.

Louisville & Eastern Railroad, Louisville, Ky.—The receiver of the Louisville & Eastern Railroad has been authorized by Judge Evans of the Federal Court at Louisville to issue $337,624 of receiver's certificates to complete the road to Shelbyville, a distance of 24 miles, on which about $400,000 has been expended.

Meadville & Conneaut Lake Traction Company, Meadville, Pa.—The Meadville & Conneaut Lake Traction Company has lately elected new officers as follows: L. A. Frazier, president; Dr. J. A. McCready, first vice-president; C. Hallen, secretary; W. H. Sief, treasurer; A. L. Newhand, auditor; F. R. Shyrock, general manager and park manager; E. O. Shyrock, superintendent; F. R. Shyrock, purchasing agent; George D. Schreber, engineer of power station; William Watson, master mechanic.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—The Milwaukee Electric Railway & Light Company has arranged to retire $500,000 first mortgage 5 per cent bonds issued by the West Side Railroad, which mature on July 1, 1909, and to pay the accompanying coupons due July 1, 1909, on and after that date on presentation at the Trust Company of America.

Newport News & Old Point Railway & Electric Company, Newport News, Va.—The notes of the Citizens' Railway, Light & Power Company and the Danville Railway & Electric Company, aggregating $220,000, which were secured by the deposit of stock of the Newport News Company, have been cancelled as requested by the Maryland Trust Company, Baltimore, trustee of the general mortgage, and Alexander Brown & Sons, Baltimore, and the suit filed with the United States Circuit Court at Norfolk in February, 1909, asking for the appointment of a receiver, has been withdrawn.

Old Colony Street Railway, Boston, Mass.—The Railroad Commission has granted the Old Colony Street Railway permission to issue coupon or registered bonds at par value not to exceed $275,000, payable 50 years from date and bearing interest at the rate of 4 per cent, as necessary for meeting the cost of additions and improvements.

Richmond Railway & Power Company, Richmond, Va.—On page 1140 of the issue of the ELECTRIC RAILWAY JOURNAL for June 19, 1909, mention was made of a plan to organize the Virginia Railway & Power Company under the laws of Virginia to take over the property of the Virginia Passenger & Power Company, the Richmond Passenger & Power Company and the Richmond Traction Company from the receivers on June 30, in accordance with the plan of the bondholders. It has since been decided that the name of the new company shall be the Richmond Railway & Power Company, and this company will organize as follows: Frank Jay Gould, New York City, chairman of board of directors; Wm. Northrop, Richmond, president; Fritz Sitterding, Richmond, vice-president; Henry W. Anderson, Richmond, vice-president and general counsel; Guy Phillips, New York, secretary and treasurer; Geo. B. Williams, Richmond, assistant secretary and assistant treasurer; R. H. Keim, Richmond, general auditor; A. B. Guigon, Richmond, assistant counsel; G. H. Whitfield, Richmond, general superintendent of light and power department; C. B. Buchanan, Richmond, general superintendent of railways. William Northrup, one of the receivers, informs the ELECTRIC RAILWAY JOURNAL that the plans for the development of the system have not yet been decided upon.

Roanoke Railway & Electric Company, Roanoke, Va.—The stockholders of the Roanoke Railway & Electric Company held their annual meeting at Roanoke recently. R. D. Apperson, president of the company, submitted his report, which showed that the company made very satisfactory progress during the year. Since the last report it has obtained control of the Roanoke Water Power Company and has built a three-story office building. The directors and officers were all re-elected.

Rockland, South Thomaston & Owl's Head Railway, Rockland, Maine.—The Rockland, South Thomaston & Owl's Head Railway, which was in the hands of receivers, has been succeeded by the Rockland, South Thomaston & St. George Railway, which has organized as follows: John L. Donahue, president; M. A. Johnson, vice-president; Henry M. Wise, secretary and treasurer; John T. Berry, superintendent and master mechanic.

Shelburne Falls & Colrain Street Railway, Shelburne Falls, Mass.—The Shelburne Falls & Colrain Street Railway has petitioned the Massachusetts Railroad Commission for the authority to issue $25,000 in stock to extend its line across the Deerfield River at Shelburne Falls.

Uvalde (Tex.) Street Railway.—The Uvalde Street Railway has been leased for one year to Peterson & Avant, San Antonio, Tex., and M. M. McFarland, Uvalde, Tex.

Wheeling (W. Va.) Traction Company.—A dividend of 1 per cent has been declared on the $2,000,000 stock of the Wheeling Traction Company, payable on July 15, 1909. This is the first distribution on this stock since July 1, 1903, when 1 per cent was declared. The first dividend of 1 per cent was disbursed on this stock on Jan. 10, 1903.

In answer to the petition of residents of Rockville, Lucknow and Feldheim for a reduction of fare on the Fort Hunter line of the Central Pennsylvania Traction Company, Harrisburg, from 10 cents to 5 cents, the officials of the company state that the line has never been self-sustaining; that the company has not paid its stockholders dividends for years, and point to the returns annually made to the city by the company on the basis of 3 per cent of the gross receipts, which showed a decrease from $17,568.15 in 1907 to $17,307.59 in 1908.

Traffic and Transportation

Arbitration of Wages at Scranton.

The full text of the Board of Arbitration in the question of the readjustment of the wages and terms of service of the employees of the Scranton (Pa.) Railway is now available. As stated in the issue of June 19, the board consisted of five members, H. E. Paine and D. B. Atherton for the company, and William Corless and P. E. Kilcullen for the men, with Judge George Gray, of the United States Circuit Court of Appeals, as chairman. The men desired a flat rate of 25 cents an hour for motormen and conductors, as compared with the rate of 20, 21 and 22 cents an hour, respectively, for the first, second and third year of service now in force, and an increase of 20 per cent for men employed in various capacities in the shops and barns. The company was represented by H. B. Gill, Philadelphia, chief counsel; C. P. O'Malley, of Willard, Warren & Knapp, local counsel for the company; C. L. S. Tingley, vice-president of the American Railways Company; Frank Caum, general manager, and P. T. Reilly, superintendent.

The first reports of the decision of the board were erroneous in a few particulars. The decision in regard to the motormen and conductors was that they shall receive 20 cents an hour during the first year of their employment, 22 cents an hour during the second year of their employment, 23 cents an hour during the third, fourth and fifth years of their employment, and 24 cents an hour during and after the sixth year of their employment. The wages of the other employees of the company are increased 1 cent an hour.

The arbitrators in their decision paid a great deal of attention to the claim of the employees that a flat rate be paid to all motormen and conductors of 25 cents an hour. They found that, while this rate was paid in some cities, it should not be considered as furnishing a standard for Scranton any more than a case in which a lower rate of compensation was paid. On the other hand, the social and physical conditions of Scranton and suburbs render this district an attractive place for residence.

The board expressed its opinion strongly against any flat rate of compensation, because it would ignore entirely the benefits derived from experience. On this point the report says:

"It must, of course, be admitted that the occupation of either a motorman or conductor is one involving a high degree of responsibility and of a fair degree of skill. It requires measurable time and experience for the motorman to acquire that co-ordination of nerve power and quick mental perception to enable him to carry his car safely through crowded thoroughfares or to meet the emergencies that must occasionally arise in the conduct of his business. The conductor, too, has much to learn by experience in the handling of large crowds, and in the collection of fares. In safeguarding the passengers under his charge his duties require a cultivated courtesy, restraint of temper, and quick intelligence. The testimony shows very clearly to the undersigned that these qualities are developed by experience, and that men become more valuable as their service lengthens. Again, it is in the natural order of human experience, that young men in any employment, while recognizing the necessity of a novitiate, should be entitled to look forward to something in the way of increased compensation by reason of lengthened service and increasing maturity of their physical and intellectual powers. The fidelity to the service in which one is engaged as evidenced by lengthened employment is valuable to the employer, and is properly recognized by an increase in compensation. All these considerations are ignored in the demand for a flat rate of payment."

The demand that promotion and day work be given to men according to length of service was disallowed as being undue and unwise interference with the discretion of the management of the company. This claim was made for the power-station employees as well as for car crews.

An interesting feature of the hearing was the deliverance by Judge Gray made in reply to the argument by the counsel for the men that the latter were entitled to an increase in wages because of the prosperity of the Scranton Railway. Judge Gray said that the two questions had no relation to each other. Continuing, he said:

"Wages are not rated, however much you may think of the ability of the man to pay them, upon the mere income; that is, this is not a profit-sharing institution and you do not make any claim to that. You put it in to show that they have the ability to pay fair wages and that they can not come in here in *forma pauperis* and try to reduce wages because they are not able to pay them. That would be absurd, for we do not fix wages, you know, on what may be the profits of a concern, otherwise it would be a profit-sharing and a partnership instead of an ordinary employment."

Injunction Against Boycott at Evansville Made Permanent

The temporary injunction secured by the Evansville & Southern Indiana Traction Company, Evansville, Ind., on June 7, 1909, from C. A. DeBruler, judge of the Vanderburgh Circuit Court, against former employees of the company and others, restraining them from interfering with the company's business by intimidating persons anxious to avail themselves of the facilities of the company has been sustained by the court in a vigorous opinion which prohibits the boycott, holding it to be a conspiracy.

The demands of the employees of the Evansville & Southern Indiana Traction Company for a readjustment of the terms of service with the company and the attitude of the company were referred to in the issues of the Electric Railway Journal of May 29, 1909, and June 5, 1909, and in the issue of June 12, 1909, the failure of the strike of the men was noted. In fact, within three days after the men went on strike cars were operated again on schedule. Realizing that they had lost, the men declared a boycott against the company, and the company, in order to mimimize the effect of the boycott and to protect its new employees, secured the injunction which has just been sustained.

At the hearing before Judge DeBruler affidavits were presented from H. W. Marshall, president of the company, and F. M. Durbin, general manager, showing that the company is operating with a permanent set of men, but that if the injunction were disallowed some of these men might leave the company through fear. The boast of one of the advisers of the strikers, made before the Consolidated Business Association, about the probable cost of the strike to the company was also cited. It was also shown that one of the advisers of the strikers had made an incendiary speech at a strike in another city which had caused a riot.

The temporary injunction secured by the company says in part:

"The plaintiff, having filed its verified complaint herein, praying for a temporary restraining order, and plaintiff having filed its undertaking to the approval of the judge of this court, it is ordered that the defendants * * * and all other persons, and all other persons co-operating with said defendants and each of them be and they hereby are restrained from in any manner interfering with, hindering or obstructing or stopping the business of this plaintiff or its employees in the operation of the cars of this plaintiff; from picketing or maintaining at or near the car houses, shops, power houses, or along the tracks of this plaintiff any picket or pickets; from assaulting or intimidating, by threats or otherwise, the employees of this plaintiff or any persons who may become or seek to become employees of said plaintiff; from congregating about or near the car houses, shops, power houses, or along or near the tracks of plaintiff or in any other place for the purpose of compelling, inducing or soliciting the employees of this plaintiff to leave its service or of preventing or attempting to prevent any person from freely entering into the service of this plaintiff; from interfering with or attempting to interfere with, by force, threats or intimidation, the employees of this plaintiff in the operation of plaintiff's cars and railway system in the usual and ordinary way; from following the employees of this plaintiff to their homes or other places for the purpose of inducing them by threats or intimidation or otherwise to leave the employ of this plaintiff; from attempting by bribery, payment or promise of money or other rewards to induce the employees of plaintiff to leave the service of this plaintiff; from attempting to induce persons from abstaining from patronizing this plaintiff's street cars; from congregating about or near the places of business of this plaintiff or about or near any place where their employees are lodged or boarded, for the purpose of compelling, soliciting or inducing the employees of the plaintiff to leave the service of the plaintiff or to refuse to work for the plaintiff or for the purpose of preventing or attempting to prevent any person from freely entering the service of the plaintiff, from organizing or maintaining any boycott against the plaintiff, from sending any circulars or other communications to patrons of the plaintiff's road for the purpose of dissuading them from patronizing or riding upon the cars of the plaintiff; from assembling at and picketing the different railroad stations and all other places in Evansville for the purpose of preventing persons and the public from entering and riding upon the ears of this plaintiff; until notice and the further order of this court."

Notice of Change of Fare by Indiana Company

The Indiana Union Traction Company, Anderson, Ind., recently addressed this notice of a change in rates on its lines to its patrons: "The interurban passenger fares of this company have been readjusted and equalized, being placed on a uniform rate basis over the entire system, effective June 10, 1909. All tickets will be good on either limited or local trains (with a few exceptions) without excess fare. The Central Electric Traffic Association 1000-mile book, good over the principal interurban lines of Indiana and Ohio, price, $17.50, will be the only mileage book sold on and after June 10, 1909. All other mileage books will be withdrawn from sale, but outstanding books will be honored within their time limits. In place of the mileage books withdrawn, a 54-ride commuter's book, good between all stations during the month of issue, will be sold at 1¼ cents per mile. Round-trip tickets will be sold at reduced rates, good only in the direction in which they read. For further information please apply to the ticket agent."

Under date of June 1, 1909, H. A. Nicholl, general manager, addressed the following communication to officials, agents and employees of the traffic and transportation departments of the company:

"On June 10, 1909, a readjustment of the interurban passenger fares of the company will become effective. In order that you may be correctly informed concerning this readjustment, the following statement is made:

"In the growth of the interurban system of the Indiana Union Traction Company, extending over a period of about 15 years, and involving the present operation as a unit of what were formerly a number of independent lines, inequalities have arisen in the rates of fare upon the different lines of the company. This arises from the fact that the rates of fare originally established on the various lines, which were constructed or acquired at different times, by different companies and under varying conditions, have been maintained as the lines have been from time to time merged into larger systems. By the readjustment referred to, all fares over all lines of the company have been equalized and placed on a uniform rate basis, so far as possible.

"Also, the company has been led to believe that the system of charging excess fare on limited cars was objectionable to a considerable part of the traveling public. It has therefore undertaken the experiment of abolishing these excess fares, except in a few instances where the forced inadequacy of the local fares or the necessity of preventing the crowding of limited cars compels the company to continue the charge. This important change, which it is believed the public will appreciate, means that the same tickets and the same rates of cash fares will apply to all cars, whether limited or local, including the Marion Flyer, the Muncie Meteor and the special Kokomo Limited.

"The readjustment also involves another radical change in the abolishment of the 'zone system' of establishing fares, which system has been used by this company, as well as by practically all other interurban companies, in making up its fare charges. Under this system, inherited from city street railroad practice, the interurban lines of the company have been divided into 'fare zones,' within each of which a 5-cent fare has been charged, so that a passenger riding through any portion of two fare zones, no matter how short the distance, would be required to pay a fare of 10 cents. The readjustment does away with this system and charges according to the actual distance traveled, and obviates criticism based on the ground that such fares violate the 2-cent fare law.

"All mileage books will be withdrawn except the 1000-mile interchangeable Central Electric Traffic Association ticket good over the principal interurban lines of Indiana and Ohio. To meet the case of the daily rider whose home and place of business are at different places, a system of commuter books good for 54 rides in the month in which issued between the points specified, at a rate of 1¼ cents per mile each way, will be placed on sale.

"The readjustment will in some instances increase, in others lower, and in others make no change in the present rates of fare. In those cases where the effect will be to increase fares, the changes will be slight, and in no case more than sufficient to place the fares on a basis now believed to be commensurate with the cost of the service. This cost, it should be noted, has been materially increased in recent years by the increased cost of practically every element entering into electric railroad operation, combined with the necessity of extensive renewals in track, overhead and rolling stock, and of expensive betterments and improvements in roadbed, equipment and service. The effect of this increased cost has been intensified by the falling off in earnings which began in the fall of 1907, due to business depression and keen competition.

"You will observe in this connection that the rates of fare heretofore in effect on several of the more important lines of this company have been, and under the readjustment will continue to be, lower than those of many of the other interurban lines of Indiana and Ohio and other States. In spite of this fact, the company will endeavor to give the highest grade of interurban railroad service and in so doing it asks the aid and co-operation of all to whom this communication is addressed."

Methuen Fares to be Considered.—The Selectmen of Methuen, Mass., have petitioned the Railroad Commission for an extension of the fare limit on the Boston & Northern Street Railway so that patrons of the Lowell line may be transported from the Lawrence transfer station to the Methuen and Dracut town line for 5 cents. A hearing will be given by the commission.

Accident on Chicago, Lake Shore & South Bend Railway.—In a head-on collision between two cars of the Chicago, Lake Shore & South Bend Railway, South Bend, Ind., near Dune Park, Porter County, Ind., on June 19, 10 persons are reported to have been killed and 40 injured. The wreck is said to have been due to the failure of the motorman of the eastbound car to observe an order to wait at Wilson for the westbound car to pass.

Fare Order Issued by Ontario Board.—The Ontario Railway & Municipal Board has instructed the International Traction Company, Buffalo, N. Y., to accept a 5-cent cash fare for any distance not exceeding 3 miles on its line between Queenstown and Chippewa, Ont. Children under 10 years of age must be carried 3 miles for 3 cents, and any additional distance 1 cent per mile. School pupils are to have the privilege of purchasing eight tickets for 25 cents for 5 miles and under during school hours.

Turnstiles on Brooklyn Bridge.—The Brooklyn Rapid Transit Company has installed turnstiles at the terminal of its elevated lines at the Manhattan end of the Brooklyn Bridge, but is using those at the entrance to the Fifth Avenue group of lines only during the rush hours. The company says that turnstiles afford a better check on the number of tickets sold and tend to regulate traffic by forcing it into channels. The turnstiles will be made permanent if they prove successful under the strain of actual service.

Chicago's Devil Strip.—The agitation for a wider devil strip between the reconstructed tracks of the Chicago surface railways continues, several people having recently been killed by being caught between cars moving in opposite directions. A letter on this subject by Bion J. Arnold was printed on page 1142 of the ELECTRIC RAILWAY JOURNAL of June 19, 1909. Mr. Arnold recommends that the distance between track centers be increased from 9 ft. 8½ in. to 10 ft. 2 in. This would make the space between cars 20 in.

Folder of the New Jersey & Hudson River Railway & Ferry Company.—The New Jersey & Hudson River Railway & Ferry Company, Edgewater, N. J., has published a new folder and time-table of its lines in northern New Jersey, which contains an excellent map of the road and its connections, printed in four colors. Owing to the increase of traffic, the company's ferry between Edgewater and 130th Street, New York, is operating on a 20-minute schedule between 1.40 p. m. and 8.20 p. m., and on a half-hour schedule for almost all of the rest of the day. The ferry connects with through cars running to four or five different points in Northern New Jersey. A number of the trips are being made with double-headers and through service to Newark has been inaugurated.

Trolley Circular of Central New York.—The New York State Railways, Rochester, N. Y., has issued a folder describing the eastern group of lines which it controls, embracing the Syracuse Rapid Transit Railway, the Oneida Railway and the Utica & Mohawk Valley Railway, all in the historic Mohawk Valley in Central New York. There is an excellent double-page map of the territory between Albany and Syracuse, on which the lines of the New York State Railways, independent connecting electric railways, connecting steam railroads, railroads that do not connect with the New York State Railways, the new barge canal and the Erie Canal are shown. At the bottom of this map there are small maps of Syracuse, Oneida, Rome, Utica and Little Falls, showing the lines in these cities. The text is illustrated with many excelleet half-tone engravings of points of interest in the principal cities in which the company operates and of scenes along the interurban lines. General information about the rate of fare, redemption of tickets, baggage regulations, children, through tickets and special service are given on the last page, together with a list of the cities and towns reached, their population, on

whieh line they are loeated, and the distanee from both Utiea and Syraeuse.

Steam Railroads Must Interchange Passenger Traffic with Electric Railways.—Aeeording to a ruling and order made by the Indiana Railroad Commission, steam railroads must stop their passenger trains at points where their lines interseet with interurban eleetric railways for the purpose of permitting the interehange of passenger traffie when sueh serviee is petitioned for and traffie justifies the expense. This ruling and order are the result of a hearing before the Railroad Commission of Indiana on the petition of the citizens of Garrett, Ind., against the Vandalia Railroad and the Toledo & Chicago Interurban Railway, seeking an interehange of passenger traffie between the steam railroads and the interurban railways at their interseetion south of Garrett. The case was heard by the commission on June 14, and the commission found that it would be praeticable for the Vandalia Railroad to stop all of its passenger trains and its freight trains carrying passengers, at or near the crossing of the Toledo & Chieago Interurban Railway, south of Garrett for the purpose of permitting passengers to change from one line to the other. An order has therefore been issued by the commission that beginning July 1, 1909, the Vandalia Railroad shall stop all of its passenger trains at the junetion mentioned for 60 days. If at the end of the 60 days, the Vandalia Railroad ean prove that the passenger returns do not justify it in stopping its trains, the order will be annulled, otherwise, it will be continued until July 1, 1911.

Suggestion for Indicating Excess Fare in Indiana.—The Railroad Commission of Indiana has addressed a passenger tariff eireular to all steam railroads and electrie railways in the State, requesting them to adopt, as far as praetieable, a uniform system of indicating upon passenger tariffs the charge of 10 eents additional fare authorized by the Legislature and the statutory requirements that passengers shall be given the opportunity to secure tickets at the tieket office for 30 minutes continuously before the departure of any train. A form of notice to be used is suggested as follows: "(a) When any passenger is given an opportunity for thirty (30) minutes eontinuously before the departure of any train to secure a tieket entitling said person to earriage and fails to do so, ten (10) cents in addition to the regular ticket fare will be eolleeted from sueh person, for whieh a receipt shall be given by the eonduetor, which receipt shall not be redeemable by the railroad company. (b) When passengers board trains at a station at which no ageney is maintained, or where for any reason tieket office is not open, the regular tieket fare only will be eollected. (c) Tieket offiees where trains are scheduled to stop must be open at least thirty (30) minutes eontinuously before the departure of such trains and agents will furnish passengers every reasonable facility for the purchase of tiekets. You will therefore see that these suggestions are substantially followed, either by filing supplement to existing tariffs or by filing new tariffs with the commission."

Prizes Offered for Suggestions for Preventing Accidents in Philadelphia.—One hundred dollars in prizes is offered to the motormen and eonduetors of the Philadelphia (Pa.) Rapid Transit Company for suggestions as to means of preventing accidents. In a bulletin issued by the company's bureau for the prevention of aeeidents the following announcement is made: "Several times eaeh week certain of our eonductors and motormen advance suggestions of one charaeter or another in conneetion with our aecident work. Many of these suggestions have in the past proved of the greatest assistanee to us. With a view to stimulating interest in this direction, we shall offer 10 eash prizes of $10 each for the 10 best suggestions of this eharacter which may be submitted between now and July 1. Competition will be open to all men of the surface divisions and the Market Street Elevated. No restrietions will be placed upon the eharacter of suggestions which may be offered, other than that they shall relate either to the work of handling accidents, or to the problem of preventing the oceurrence of aecidents. If you ehance to have any original ideas along this line, do not hold them back because of any fancied deficieney in penmanship, spelling, punetuation, grammar or composition. We will take eare of that for you with pleasure. What we are after is the thought, or the suggestion, or the idea, which you may have in mind. The manner or form in whieh it may be expressed by you will be purely of seeondary eonsideration. Should several suggestions occur to you, let us have all of them, for no limit will be placed upon the number whieh may be submitted by any one man. If one suggestion does not prove suecessful, another may." This prize offer should meet with a hearty response from the platform men as they have had the accident question explained to them from many standpoints by the claim and transportation departments.

Personal Mention

Mr. C. C. Watkins has been elected treasurer of the Owensboro (Ky.) City Railroad to sueceed Mr. J. H. Parrish.

Mr. Martin Marcussen has been appointed claim agent of the Tri-City Railway, Davenport, Ia., to suceeed Mr. R. W. Holland.

Mr. H. D. Swain has been eleeted secretary and treasurer of the Putnam & Westehester Traetion Company, Ossining, N. Y.

Mr. Stephen Stone has been eleeted vice-president of the Westmoreland County Railway, Pittsburgh, Pa., to sueceed Mr. P. Ridge.

Mr. J. H. Davis has been appointed eleetrieal engineer of the Baltimore & Ohio Railroad in Baltimore to sueceed Mr. L. T. Gibbs, deceased.

Mr. J. H. Bradt has been eleeted viee-president of the Twin City & Lake Superior Railway, Minneapolis, Minn., to suceeed Mr. W. H. Crossland.

Mr. A. E. Locke, Boston, Mass., has been elected president of the Norwich & Westerly Railway, Poquetanuck, Conn., to sueeeed Mr. H. H. Gallup.

Mr. W. P. Stottlemyer has been elected treasurer of the Chambersburg, Greeneastle & Waynesboro Street Railway, Waynesboro, Pa., to succeed Mr. D. M. Wentz.

Mr. George T. Schofield, Cleveland, Ohio, has been eleeted treasurer of the New York & North Shore Traction Company, Roslyn, N. Y., to suceeed Mr. James R. Nutt, Cleveland.

Mr. John Harrington, assistant superintendent of Division 7 of the Boston (Mass.) Elevated Railway, has been appointed superintendent of that division to succeed John J. Horgan, deceased.

Mr. John H. Derby, who reeently resigned as fire proteetion engineer of the Metropolitan Street Railway, New York, N. Y., was tendered a farewell dinner at the Park Avenue Hotel, New York, on June 17, by about 20 of the offieers of the company.

Mr. W. A. Shay has been appointed inspeetor of the San Bernardino Valley Traction Company, San Bernardino, Cal., to sueeeed Mr. Louis Hatch, resigned. Mr. Shay entered the employ of the eompany as a conductor, but for some time has been ehief dispateher of the eompany.

Mr. John W. Paine, for several years assistant treasurer of the Houghton County Traetion Company and the Houghton County Eleetric Light Company, Houghton, Mieh., has been appointed treasurer of the companies to sueeeed Mr. J. Harry Dufresne, who has recently been appointed assistant treasurer of the Northern Texas Traction Company, Fort Worth, Tex.

Mr. William H. Swain, who has been superintendent of the Summit, Millburn & Springfield division of the Morris County Traction Company, Morristown, N. J., has been appointed to a similar position on the Dover division, and Mr. Wilmer F. Siekley has been appointed to sueceed Mr. Swain as superintendent of the Summit, Millburn & Springfield division of the eompany.

Mr. M. Curry Turpin has become connected with the Public Service Commission of the First Distriet of New York as an eleetrical engineer, and is at present engaged on the appraisal of the property of the Brooklyn Rapid Transit Company which is being made by the Public Service Commission. Mr. Turpin was formerly superintendent of the Auburn Light, Heat & Power Company, Auburn, N. Y.

Mr. P. H. Palmer has been appointed to the recently created position of assistant to the general manager of the Kokomo, Marion & Western Traetion Company, Kokomo, Ind. Mr. Palmer has been associated with the Kokomo, Marion & Western Traction Company for the last five years as electrical engineer for the railway department and as superintendent of the light department, which positions he still retains.

Mr. Matthew Bigger has resigned as purchasing agent of the Philadelphia Company, Pittsburgh, Pa. Mr. Bigger became connected with the company in February, 1886, two years after its organization. In 1890, he was given the additional duties of general contracting agent, but in May, 1908, the offiee was divided, Mr. Bigger remaining general purchasing agent and Mr. Samuel B. Stewart becoming general contracting agent. Mr. Bigger enlisted as a private in Company F, Thirty-fourth Ohio Volunteers, immediately after President Lincoln's call for volunteers in 1861, and was mustered out at the end of the war as a second lieutenant.

Mr. Edmund S. Davis, principal assistant to Howard A. Carson, chief engineer of the Boston Transit Commission since the beginning of the subway and tunnel work in Boston, has been appointed acting chief engineer of the commission, the appointment to take effect July 1. Mr. Davis, who is about 60 years old, was born in Northfield, Vt., but has lived in Massachusetts many years. From 1875 to 1879 he was employed on the Boston Water Works. In 1880 he went to Leadville, Col., and was employed in the United States Surveyor-General's office. The following year he went to Denver, Col., and in 1887 he received the appointment of chief of the mineral division of the United States Surveyor-General's office at Denver, and retained the position until 1890, when he resigned and came to Boston to reside. He became associated with Mr. Carson when the latter was appointed chief engineer of the Boston Transit Commission in 1894, and has served with Mr. Carson since that time.

Mr. Howard Adams Carson has resigned as chief engineer of the Boston Transit Commission. Mr. Carson was born in Westfield, Mass., on Nov. 28, 1842, and was graduated from Massachusetts Institute of Technology in 1869 with the degree of B.S. He was assistant engineer of the Providence water works in 1871 and in 1873 was in charge of that city's sewer construction. He was principal superintendent of the construction of the main drainage system of Boston in 1878. Later he designed and was chief engineer of the North Metropolitan and Charles River Valley sewerage systems, which combined service for about 20 cities and towns, with numerous siphons under tidal estuaries and an outlet, 1800 ft., into the sea from Deer Island. He was named chief engineer of the Boston Transit Commission Aug. 30, 1894. Mr. Carson is a trustee of the Massachusetts Institute of Technology, a member of the Institution of Civil Engineers in London, the American Society of Civil Engineers, Boston Society of Civil Engineers, of which he is a former president, and the Alumni Association of the Massachusetts Institute of Technology.

Mr. Hugh M. Wilson, formerly proprietor of the *Electric Railway Review* and also of *The Railway Age*, has just returned to this country from a trip abroad of about eight months. On the evening of June 19 Mr. Wilson was tendered a banquet by a number of his friends and former associates in the steam and electric railway industries, at the Chelsea Hotel, in Atlantic City. About 200 persons were present. Among those who replied to the toasts were Mr. W. H. Boardman, of the *Railway Age-Gazette;* Mr. H. W. Frost, who was associated with Mr. Wilson on *The Railway Age* for a number of years, and Col. George A. Post. In replying to these speeches, Mr. Wilson expressed appreciation of the compliments which had been extended to him, and then referred to some of the ideals in technical journalism which he had endeavored to follow in his newspaper work. He dwelt strongly upon the importance of appealing to the human interest of the reader, as well as to the scientific and technical aspects of the industry represented by the paper. He said he did not consider that engineering and business problems in their final analysis related to mechanics and mathematics merely, but were problems whose solution involved the welfare of the human race. According to him, the interworking of political, economic and business forces was never so pronounced in any nation as it is with us to-day. During the dinner Mr. Wilson was presented an engrossed and illuminated parchment which referred to his 18 years' presidency and editorship of *The Railway Age*, to his services to the railroad industry through the publication of that paper and its daily edition, and to other ways in which he had gained the gratitude and esteem of operating railroad officials and supply men throughout the country.

OBITUARY

Julius R. Jacobson, superintendent of the Sao Paulo Tramway, Light & Power Company, Ltd., Sao Paulo, Brazil, and special representative in Brazil of the General Electric Company, was drowned in a motor boat accident in Brazil recently. Mr. Jacobson was one of the party of fifteen persons, six members of which lost their lives.

James A. Richmond, formerly president of the Broadway Surface Railroad, New York, and long prominent in street railway affairs in New York, died in Paris recently. Mr. Richmond was born in Little Falls, N. Y., in 1830, and after having been in business in New York for several years he bought an interest in the stage line which was operated on Broadway. He was one of the organizers of the Broadway Surface Railroad, which succeeded the Broadway stage line, and was president of the company for some time. He retired from business late in the 80's.

Construction News

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

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

RECENT INCORPORATIONS

***Vincennes Western Electric Railroad, Vincennes, Ind.**—Incorporated to build an electric railway 14 miles in length to connect Vincennes and Bridgeport, Ill. It is reported that a contract has been let to Wm. L. Sontag, Evansville, for financing and constructing the proposed railway which includes a bridge across the Wabash River. The company also proposes to furnish power for lighting. Robert V. Stinson, Vincennes, president; J. D. Lacroix, Vincennes, secretary.

***Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.**—Incorporated to build an electric railway from Nelsonville to Athens with branches to Chauncey and from Sugar Creek to the Sugar Creek coal mines. Headquarters, Nelsonville. Capital stock, $300,000. Incorporators: E. B. Young, J. Gaston Coe, M. A. King, Chas. A. Vorhes, Warren N. Badger, H. H. Isler and Chas. E. Poston.

***Oakland & Tidewater Railway, Portland, Ore.**—Incorporated to build an electric railway from Oakland to Empire. Capital stock, $1,000,000. Headquarters, Portland. Incorporators: C. A. Pengra, H. D. May and W. W. Purdy, Portland.

FRANCHISES

Bessemer, Ala.—The City Council has granted to the Birmingham & Gulf Railway & Navigation Company, Birmingham, an extension of its franchise of 14 months to build its proposed railway in Bessemer. This company has been granted extensions of its franchises in the towns of East Lake, Graymont and Pratt City.

Birmingham, Ala.—The Birmingham Railway, Light & Power Company has applied to the City Council for a franchise to build a number of new lines over certain streets in Birmingham. A. H. Ford, president and general manager.

Sacramento, Cal.—A. L. Shinn, representing the Central California Traction Company, has applied for a franchise to build a street railway on Thirty-first Street, from X to Y Streets, to connect the X Street railway with the railway through Oak Park, for which the supervisors recently granted the franchise. [E. R. J., June 12, '09.]

***Pensacola, Fla.**—C. E. Dobson, C. C. Goodman and R. O. Hoffman have applied to the City Council for a franchise to build a street railway on certain streets of Pensacola.

Moscow, Idaho.—A franchise has been granted to the Spokane & Inland Empire Railroad, Spokane, to build and operate an electric railway in Moscow.

New York, N. Y.—The Public Service Commission of the First District has approved the franchise granted by the Board of Estimate and Apportionment to the New York & North Shore Traction Company for an extension of its surface line from the city line at Little Neck into Flushing, and from Chestnut Street, Flushing, to Whitestone.

Tulsa, Okla.—The City Commissioners have granted to the Oklahoma Union Traction Company a 25-year franchise. The franchise provides that the company must commence grading within 40 days and the railway completed within a year after the franchise has been granted. The proposed railway will connect Tulsa with Sapulpa and Broken Arrow. [E. R. J., May 22, '09.]

***Aberdeen, S. D.**—Application has been made to the City Council by A. L. Ward for a franchise to build a street railway in Aberdeen.

El Paso, Texas.—The El Paso & Fort Hancock Electric Railway has petitioned the City Council asking to be granted, without an election, a franchise to build an electric railway through certain streets of El Paso. [E. R. J., April 17, '09.]

Edgwood, W. Va.—The Rapid Transit Railway, Wheeling, has applied to the Town Council for a franchise to build an electric railway through Edgwood. This company proposes to build an electric railway connecting Pittsburgh and Wheeling. A. M. Shenk, Wheeling, president. [E. R. J., May 29, '09.]

Ellensburg, Wash.—Application has been made by A. S. Randall, representative of F. S. Farquhar, of the Cle Elum-Roslyn Railway & Power Company, Roslyn, to the City Council for a 50-year franchise to build an electric railway on certain streets of Ellensburg. [E. R. J., May 22, '09.]

Walla Walla, Wash.—A franchise has been granted to the Walla Walla Valley Traction Company, by the County Commissioners, to build an electric railway on Yellow Hawk Avenue to Prospect Heights. [E. R. J., Feb. 20, '09.]

Ashland, Wis.—The Ashland Light, Power & Street Railway Company has been granted a franchise to build a 3-mile extension in Ashland.

TRACK AND ROADWAY

Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.—This company has let the contract for building the proposed electric railway from Fresno to Hanford to the Franklin Construction Company. Grading will be started on or before July 15, 1909. The track will be standard gage and will be laid with 75-lb. rails. F. S. Granger, Fresno, vice-president and general manager. [E. R. J., June 5, '09.]

Meriden, Middletown & Guilford Railway, Hartford, Conn.—The Legislature has extended the charter of this company to July 1, 1911.

Litchfield & Torrington Tramway, Southington, Conn.—The Legislature has extended the charter of this company until July 1, 1911, in which to begin the construction of its proposed electric railway between Torrington, Litchfield and Lake Bantam, 6 miles. T. H. McKenzie, Southington, secretary and treasurer, advises that it is the intention to build the proposed line during the summer. [E. R. J., Sept. 9, '08.]

Pensacola Electric Company, Pensacola, Fla.—This company announces that it expects to rebuild 4 miles of city track.

City & Suburban Railway, Brunswick, Ga.—This company has awarded the contract for building its electric railway in Brunswick to the Chatham Construction Company, Brunswick. F. D. Strachan, Brunswick, president. [E. R. J., June 19, '09.]

***Boise, Idaho.**—W. C. Dickey and several other capitalists are said to be interested in a proposition to build an electric railway from Burley to Albion.

Boise Valley Railway, Boise, Idaho.—It is stated that the stockholders of this company have subscribed funds to the amount of $73,000 to complete the construction of its railway into Nampa. About 5 miles of track are yet required to complete the entire system. Work will be started at once.

Springfield, Beardstown & Quincy Railway, Springfield, Ill.—W. J. Gates, vice-president, writes that this company is about ready to award the contract for the building of its proposed railway from Springfield to Quincy. [E. R. J., Feb. 13, '09.]

Fort Wayne & Springfield Railway, Decatur, Ind.—This company has completed a 12-mile extension to its railway to the southern end of Decatur, and will at once proceed to complete the line to Monroe, a distance of 7 miles.

Central Kentucky Traction Company, Frankfort, Ky.—Smethurst & Allen, Philadelphia, who have the contract to build the electric railway from Lexington to Nicholasville, of this company, have completed the preliminary arrangements for beginning work. Track will be laid with 80-lb. rails. It is the intention to have the extension in operation by Jan. 1, 1910. [E. R. J., June 5, '09.]

Boston & Northern Street Railway, Boston, Mass.—This company having received an approval of its plans for a street railway from Stoneham Square through the Middlesex Fells to Spot Pond, has awarded its main contract. The work will begin shortly and will be completed in the fall. The contract for sub-grading calls for completion on or before Sept. 15.

Delta Electric Light, Power & Manufacturing Company, Greenville, Miss.—This company, which operates the local street railway, is at present completing a 1½-mile extension to the new city park. Orders have been placed for all track material.

Kansas City, Ozarks & Southern Railway, Mansfield, Mo.—This company announces that it expects to place contracts during the next four weeks for 1000 tons of 56-lb. relaying rails. The company is building a 14-mile electric railway from Mansfield to Ava. G. W. Wilhelm, Mansfield, secretary.

Chautauqua Traction Company, Jamestown, N. Y.—It is announced that this company will resume the construction of its proposed extension from Westfield to Barcelona Harbor. A contract has been entered into by this company and the Lake Shore Railroad which permits the Chautauqua Traction Company to cross the Lake Shore Railroad at North Portage Street under certain conditions.

Oneida (N. Y.) Railway.—The Public Service Commission of the Second District has granted to this company a certificate of necessity for the construction of its proposed extension from Sherill to Kenwood, 1½ miles. The company expects to expend the sum of $68,000 for this improvement.

Peekskill Lighting & Railroad Company, Peekskill, N. Y.—This company advises that the Putnam & Westchester Traction Company, which it operates, has started to construct 1300 ft. of track through private right-of-way, and when this work is completed, approximately 1½ miles of new track will be put in operation.

Utica Southern Railroad, Utica, N. Y.—This company has filed an amended certificate with the Secretary of State at Albany as to the location of its railway. It is proposed to build it from Clinton to Hamilton with the Deansboro-Waterville branch and thence from Hamilton to Norwich. This will add 27 miles to the original length of the railway. Application will be made to the Public Service Commission of the Second District to build the extension.

Elmira, Corning & Waverly Railroad, Waverly, N. Y.—The State Highway Commission has granted the request of this company to build its electric railway on the State Highway between Elmira and Wellsburg. Work will be started on this railway within a week.

Cleveland, Barberton, Coshocton & Zanesville Railway, Cleveland, Ohio.—The directors of this company have authorized an issue of $6,000,000 in bonds, the proceeds to be used in building an electric railway from Cleveland to Zanesville, via Elyria, Barberton, Orrville, Millersburg and Coshocton. J. J. Breitinger, president. [E. R. J., June 5, '09.]

Dayton & Troy Electric Railway, Dayton, Ohio.—It is announced that this company will build an extension in the southern part of Piqua. The new line will cost about $25,000. C. M. Paxton, general manager.

Pittsburgh & East Liverpool Electric Railway, East Liverpool, Ohio.—This company has completed the surveys, and, for the most part, the right-of-way from Pittsburgh to East Liverpool of its proposed railway. The building of this railway is now being considered by eastern capitalists, who, it is said, will finance it. J. M. Reed, Pittsburgh, Pa., president. [E. R. J., Dec. 5, '08.]

Ardmore, Okla.—Oscar Ayres, Ardmore, writes that a company has not yet been organized to build the proposed standard-gage railway which is to extend from Ardmore to Chickasha, Duncan and Fort Sill, 170 miles. Arrangements have been completed for nearly all of the right-of-way and other preliminary work. Electricity will be used for hauling passengers and light freight, and steam will be used for heavy freight service. It is proposed to build a water-power plant on the Washota River. M. T. Forsythe, West Chester, Pa., engineer. [E. R. J., June 12, '09.]

Berlin & Waterloo Street Railway, Berlin, Ont.—This company expects to place contracts during the next four weeks for the construction of about 1 mile of double track through Berlin. V. S. McIntyre, Berlin, secretary.

Scranton & Lake Ariel Railway, Scranton, Pa.—This company has practically secured all the right-of-way for its proposed electric railway between Scranton and Lake Ariel, 20 miles. It is the intention to start work during the coming season. John J. Brown, president. [E. R. J., June 19, '09.]

Clemson College, S. C.—W. M. Riggs, of the faculty of Clemson Agricultural College, writes as follows: "Our trustees some time ago considered the advisability of putting in an electric railway between the College and the railway station of Calhoun on the Southern Railway, but no decision was reached, and in my judgment, they will not build a railway, as it is not practicable from a commercial standpoint." [E. R. J., June 12, '09.]

Sioux Falls (S. D.) Traction System.—F. M. Mills, president, advises that construction work is under way on a 2-mile extension of this company's line across the river to East Sioux Falls. During the last few months the company improved its system by building 3 miles of new track, a new car house, having a capacity for 8 cars, and containing an office and waiting room.

San Antonio (Tex.) Traction Company.—J. J. King, general superintendent, writes that this company will build a 3-mile extension to Lakeview. Work will be started Sept. 1. Rails and ties have been ordered.

Spokane & Inland Empire Railroad, Spokane, Wash.—Work has been started by this company grading the line from Spokane to Greenacres by way of Opportunity. This will be a part of the general plan to double track the Cœur d'Alene division of the electric system. The connection with Greenacres will virtually give the company double-

track facilities as far as Spokane bridge. It is expected that work will be started this fall on the double tracking of the remainder of the line from Spokane bridge to Cœur d'Alene city. The construction of the new line from Spokane to Greenacres is being done under the supervision of Alex M. Lupfer, chief engineer.

SHOPS AND BUILDINGS

Connecticut Company, Hartford, Conn.—Plans have been approved for a new car house to be built by this company for its Willimantic and South Coventry line. It is the intention to start construction at once.

Tampa-Sulphur Springs Traction Company, Tampa, Fla.—This company advises that it is considering the purchase of a car-wheel borer and facing machine. L. Brill, Tampa, manager.

Norfolk & Bristol Street Railway, Foxboro, Mass.—F. M. Perry, superintendent, writes that this company, in the near future, expects to install a sprinkler system in its car house.

Ohio Electric Railway, Cincinnati, Ohio.—It is reported that this company has secured an option on the Beaver Building, Dayton, which it proposes to convert into a freight depot for the use of several electric railways entering Dayton. This company has also asked for the privilege of relaying its tracks on Main Street in Dayton.

Bluestone Traction Company, Graham, Va.—This company advises that contracts will be placed during the next few weeks for the erection of a new car house. P. M. Walizer, manager.

Washington Water Power Company, Spokane, Wash.—This company has purchased in Spokane a site 256 ft. x 305 ft. for its proposed car house. It is stated that the company expects ultimately to provide room for about 125 cars. Work will begin this summer on a portion of the building. The plans for the building are now in the hands of the architects.

POWER HOUSES AND SUBSTATIONS

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—This company has recently contracted with the General Electric Company, Schenectady, N. Y., for the purchase of 1 500-kw, 25-cycle, 600-volt rotary converter, 3 air blast 13,200-volt to 430-volt, 185-kw transformers, together with the necessary reactive coils, oil switches and switchboard panels.

Stark Electric Railroad, Alliance, Ohio.—This company will increase the capacity of its present power station, having purchased one 1000-kw Westinghouse turbine with condenser and other accessories. Knox Engineering Company, Fisher Building, Chicago, engineers.

Portland Railway, Light & Power Company, Portland, Ore.—Fire at the substation of this company on Seventh Street, Portland, on June 14, caused a loss to machinery estimated at about $100,000. Two of the six transformers were ruined by water and two of the rotary converters were damaged from same cause. The entire West Side service was tied up for two hours.

Columbia Power, Light & Railways Company, Bloomsburg, Pa.—The contract for the furnishing of power to this company by the Harwood Electric Company has been signed and work will be started at once on the construction of a 16-mile high-tension line from the Harwood plant to Berwick, where it will connect with the railway company's lines.

Roanoke Railway & Electric Company, Roanoke, Va.—This company has about completed the repairs to the raceway of its power dam and power is now being used from the plant. A concrete wall, 120 ft. x 20½ ft. x 5 ft. was built at this point.

Washington Water Power Company, Spokane, Wash.—Work is under way on the substation of this company on Post Street on the south bank of the river. Two stories of the walls have been built. The structure will be four stories high and will be 208 ft. x 108 ft. in size. It will be 85 ft. high from the foundation. On each corner of the building will be large towers 24 ft. square, surmounted by a sphere. The construction material will be brick and concrete and the building will be fireproof. There will be but one room on each floor. The steel girders supporting the roof will rest on conerete piers. The building will cost about $100,000.

Ashland Light, Power & Street Railway Company, Ashland, Wis.—This company has purchased the plant and buildings of the White River Power Company, including dam and power station, having a capacity of 1000 kw, at White River, transmission lines, substation at Ashland, etc. The consideration is said to have been $150,000.

Manufactures & Supplies

ROLLING STOCK

North Alabama Traction Company, New Decatur, Ala., will buy a set of double trucks.

Hornellsville & Canisteo Railway, Hornell, N. Y., expects to purchase two 10-bench open cars.

Springfield (Ill.) Consolidated Railway has ordered five 22-ft. closed cars from the American Car Company. Mention of the contemplated purchase of these cars was made in the ELECTRIC RAILWAY JOURNAL of March 20, 1909.

Portsmouth (N. H.) Electric Railway has ordered 20 registers from the Sterling-Meaker Company, Newark, N. J.

Wilmington, New Castle & Southern Railway, New Castle, Del., is in the market for one or two new freight cars.

Covington & Oxford Street Railway, Covington, Ga., desires to purchase two light 18-ft. second-hand cars suitable to be operated by horses.

Utica & Mohawk Railway, Utica, N. Y., did not purchase a sprinkler car as reported in the ELECTRIC RAILWAY JOURNAL of June 19, 1909, but simply tried out a car of that type.

Ohio Electric Railway, Cincinnati, Ohio, has ordered eight 40-ft. freight trailers, six 50-ft. express and six 61-ft. 6-in. interurban cars from the Cincinnati Car Company, Cincinnati.

Tri-City Railway, Davenport, Ia., has ordered Peckham trucks to be used on the 10 cars ordered from the Cincinnati Car Company which were mentioned in the ELECTRIC RAILWAY JOURNAL of June 5, 1909.

Mount Pleasant & Red Spring Railway, Mount Pleasant, Tex., has purchased two 15½-ft. gasoline motor cars, each with a seating capacity of about 16, from Fairbanks, Morse & Company, Chicago.

Keokuk Electric Railway & Power Company, Keokuk, Ia., will not purchase the three second-hand cars contemplated, as reported in the ELECTRIC RAILWAY JOURNAL of April 24, 1909, until August or September.

Albia (Ia.) Interurban Railway, mentioned in the ELECTRIC RAILWAY JOURNAL of Dec. 19, 1908, as being in the market for one coal car, has had a special car built by the McGuire-Cummings Manufacturing Company, Chicago.

Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind., is said to have placed an order for cars with the Cincinnati Car Company. It was reported in the ELECTRIC RAILWAY JOURNAL of May 8, 1909, that this company would purchase 10 city cars.

Boston & Northern Street Railway and Old Colony Street Railway, Boston, Mass., mentioned in the ELECTRIC RAILWAY JOURNAL of May 1, 1909, as having drawn specifications for 40 cars, has ordered 42 cars from the Laconia Car Company, Boston, Mass. The trucks have not been purchased as yet.

Louisville (Ky) Railway is sending out inquiries for 33 city cars. The car bodies are to be 31 ft. in length and are to be provided with eight cross seats on one side and seven cross seats on the other side. That this company was contemplating the purchase of new cars was mentioned in the ELECTRIC RAILWAY JOURNAL of June 19, 1909.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., which has placed an order for five single-truck cars with the McGuire-Cummings Manufacturing Company, Chicago, as reported in the ELECTRIC RAILWAY JOURNAL of June 12, 1909, has specified that these cars have an over-all length of 28 ft. 11 in., a seating capacity of 24 persons and a total weight of 10,370 lb. The cars are to be equipped with McGuire-Cummings hand ratchet brakes.

United Railways, Portland, Ore., has drawn the following specifications for the two vestibuled cars, reported in the ELECTRIC RAILWAY JOURNAL of June 19, 1909, as being ordered from the American Car Company: Seating capacity, 52; length of body, 51 ft. 6½ in.; length over bumpers, 57 ft. 3 in.; width over sills, 8 ft. 8 in.; width over posts at belt, 8 ft. 8 in.; curtain fixtures, Curtain Supply Company; curtain material, Pantasote; heating system, Consolidated; motors, Westinghouse 112; sanders, Nichols-Lintern; trolley retrievers, Knutson; trucks, Baldwin.

Interborough Rapid Transit Company, New York, N. Y., has ordered 170 trailer trucks from the American Locomotive Company, New York; 40 trailer trucks from the Standard Motor Truck Company, Pittsburgh, and 90 motor trucks from the St. Louis Car Company, all for subway service on the new cars recently ordered. In addition, orders were

placed with the Wason Manufacturing Company for 100 trailer trucks and the Standard Motor Truck Company for 60 motor trucks to be used on the new cars ordered for the Manhattan elevated division. There still remains an order for 40 trailer trucks to be placed for cars to be used on this division.

Western New York & Pennsylvania Traction Company, Olean, N. Y., mentioned in the Electric Railway Journal of June 19, 1909, as having purchased two cars from the J. G. Brill Company, has ordered them to be of the semi-convertible vestibule type, and has drawn up the following specifications:

Seating capacity.....32	Destination signs....Hunter
Length of body..20 ft. 8 in.	Gongs .....Dedenda
Length over vestibule .....30 ft. 1 in.	Heaters .....Consolidated
	Headlights ....Crouse-Hinds
Width over sills... 7 ft. 9½ in.	Motors.....Two GE-54
Width over posts at belt..... 8 ft.	Registers .....International
	Sanders .....Dumpit
Interior...Cherry, mahogany finish	Seats .....Winner
	Trucks.....Brill No. 21-E
Bumpers...Brill Angle-Iron	Wheels.....Schoen 34-in.
Control system.....K-12	Track scrapers.....Brill
Curtain fix....Curtain S. Co.	Brill automatic doors

TRADE NOTES

Q M S Co. is the corporate name under which the Quincy, Manchester, Sargent Company, Plainfield, N. J., will do business hereafter.

Indiana Engineering Company, Indianapolis, Ind., a company that proposes to build electric railways, has recently been incorporated with a capital stock of $30,000. The incorporators are Henry T. Wilkerson, Albert K. Roweswell and Gilbert Helm.

Okonite Company, 253 Broadway, New York, N. Y., one of the largest manufacturers of high-grade insulated wire in this country, has recently changed from an English to a United States corporation, and has been organized under the laws of New Jersey. The following are the officers of the company: Willard L. Candee, president; H. Durant Cheever, treasurer; George T. Manson, general superintendent; William H. Hodgins, secretary. The company's factories are at Passaic, N. J.

The Buffalo Brake Beam Company of New York, Buffalo and St. Louis, has recently completed and now occupies its new factory located in Buffalo, N. Y., designed and built to meet its future requirements. The factory is equipped throughout with the latest design of individual motor driven machinery for manufacturing I-beam, special section and truss brake beams for interurban, passenger, freight and tender equipment. The company also manufactures a line of forgings consisting of brake heads, fulcrums, safety chain clips, wheel guards, hangers and steel backs for brake shoes.

Wolfe Brush Company, Pittsburgh, Pa., announces that I. R. L. Wiles has resigned as supply agent of the Missouri Pacific System, with headquarters in St. Louis, to accept the second vice-presidency of this company, in charge of railroad sales. Mr. Wiles started his railroad career in 1897 with the Chicago, Burlington & Quincy Railroad, at Plattsmouth, Neb., when he was 20 years of age. Leaving that company in 1903, he became connected with the Wabash Railroad at St. Louis, Mo. In 1906 he entered the employ of the Missouri Pacific System. The Wolfe Brush Company has been making brushes for railroads since 1851, so that Mr. Wiles' future field of operation will be practically the same as the past.

Electric Railway Improvement Company, Cleveland, Ohio, has engaged Mark Stanton as engineer and expert. Mr. Stanton was for a number of years connected with the Cleveland Electric Railway as engineer in charge of the return circuits, and for the last year has filled the same position with the Rochester (N. Y.) Railway. Mr. Stanton's services and expert advice will be at the disposal of customers and prospective customers. The company also reports that it has leased bonding cars for installing its well-known electric weld bonds to the Third Avenue Railroad, New York, the Syracuse (N. Y.) Rapid Transit Company and the Winnipeg (Man.) Electric Railway. That weld bonds are giving satisfaction in every case and are rapidly growing in popularity is proved by the numerous large orders for bonds which this company is receiving from roads which have leased cars.

Wonham, Magor & Sanger, 30 Church Street, New York, N. Y., report the receipt of an order for the H-B life guards to equip the cars of the following companies on Staten Island, N. Y.; Richmond Light & Railroad Company, the Southfield Beach Railroad and the Staten Island Midland Railroad. Wonham, Magor & Sanger are also equipping the new convertible cars of the Tarrytown, White Plains & Mamaroneck Railway, White Plains, N. Y.; have received orders from the Boston Elevated Railway for 32 equipments; from the Metropolitan Street Railway, New York, for 150 equipments; from the Westchester Electric Railroad, Mt. Vernon, N. Y., for 50 equipments, and are furnishing equipments to the Atlantic City & Shore Railroad, Atlantic City, N. J., and the Long Island Railroad, Long Island City, N. Y. Substantially 2000 sets of equipments have been contracted for in the United States within the last few months.

United States Light & Heating Company, which was incorporated in January under the laws of Maine for the purpose of taking over several electric car-lighting properties, has completed its organization. The authorized capital of the new company is $17,500,000, consisting of $2,500,000 7 per cent cumulative preferred and $15,000,000 common. No bonds are authorized. The company has taken over the Bliss Electric Car Lighting Company, of Milwaukee; the National Battery Company, of Buffalo, and the United States Lighting and Heating Company, of New Jersey, which has a plant at 22 Thames Street, New York City.

ADVERTISING LITERATURE

Hall Signal Company, New York, has published with detail illustrations an extended description of its Style "H" top post electric semaphore signal.

Maryland Steel Company, Sparrow's Point, Md., has printed a booklet describing the qualities of its Cunningham coal tar preservative paint. This publication also contains a number of micro-photograph illustrations.

Barber Car Company, York, Pa., has made up a telling publication describing the several merits of the Barber single truck. The illustrations are numerous and show the principles of construction most effectively.

Drummond's Detective Agency, New York, is sending out a circular letter referring to its 21 years of experience in handling detective work. This agency confines itself only to strictly legitimate business, handling no divorce cases.

Keystone Steel Company, Warren, Pa., has issued a folder giving tables of sizes and weights of its several types of "Kesco" wrought-steel floor plates. These plates are suitable for floors, stairways, power houses, bridges and other places.

Ohio Brass Company, Mansfield, Ohio, presents in its June Bulletin descriptions of the Chicago Lake Shore & South Bend Railway, of the Tomlinson coupler, of Mansfield's first electric railway and of the growth of the company's manufacturing facilities.

Power Specialty Company, New York, has just issued an elaborate detail catalog on the Foster superheater and on the Willits valve, Harter flexible joint and other steam specialties. Other publications printed by the company relate to high duty hydraulic rams for water supply and to Duval metallic packing.

Standard Steel Works, Philadelphia, Pa., has gotten out a new pamphlet on its rolled steel wheels for different kinds of steam and electric service. The pamphlet is accompanied by detailed drawings of the standard tender, car and motor axles adopted by the various railroad associations and by a facsimile of a dimension blank for forged and rolled steel wheels. The company will be pleased to send copies of this catalogue on request.

Goldschmidt Thermit Company, New York, in the second quarterly issue of Reactions describes a number of interesting applications of thermit-welding to electric railway work. The first article describes the method used in welding third-rail conductors on the Metropolitan Railway of Paris, which is now operating about 42 miles of double track. Another article describes the applications of thermit-welding in Los Angeles, Cal., and the third describes a successful weld of a commutator ring on a large generator in San Francisco.

General Fireproofing Company, Youngstown, Ohio, announces that it is now offering for sale its Diamond Mesh Expanded Metal manufactured by an improved process. The superiority of this product consists in the following points: The metal is not stretched, strained nor weakened; there is no danger of crystalization; the full strength of the steel is preserved; the original thickness and sectional area of the metal are not diminished; the process of manufacture induces no initial stresses in the steel; it requires no annealing; it is never brittle. The company says this process does not in any way infringe the rights of its associated competitors, so that its customers are afforded complete protection in the use of its expanded metal.