

Electric Railway Journal

A CONSOLIDATION OF

Street Railway Journal and Electric Railway Review

VOL. XXXVI.

NEW YORK, SATURDAY, SEPTEMBER 10, 1910

No. 11

McGraw Publishing Company

239 WEST THIRTY-NINTH STREET, NEW YORK

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TERMS OF SUBSCRIPTION:

For 52 weekly issues, and daily convention issues published from time to time in New York City or elsewhere: United States, Cuba and Mexico. \$3.00 per year; Canada, \$4.50 per year; all other countries, \$6.00 per year. Single copies, 10 cents. Foreign subscriptions may be sent to our European office.

Requests for changes of address should be made one week in advance, giving old as well as new address. Date on wrapper indicates the month at the end of which subscription expires.

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Entered as second-class matter at the post office at New York, N. Y.

Of this issue of the ELECTRIC RAILWAY JOURNAL, 8500 copies are printed.

NEW YORK, SATURDAY, SEPTEMBER 10, 1910.

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The Exhibits at Atlantic City

In number of exhibitors and in exhibit space occupied, the Atlantic City exhibition will exceed any previously held under the auspices of the American Street & Interurban Railway Association. This means that it will be the largest and most comprehensive exhibit of electric railway apparatus ever assembled under one roof, and that it will rival if not exceed in extent and in variety of exhibits any made to represent a single manufacturing industry at the large international expositions. A list of exhibitors with the space to be occupied by each is published elsewhere in this issue, and reflects great credit on the Manufacturers' Association, particularly the committee of exhibitors which has direct charge of the exhibition, and the membership committee, which has been most assiduous in gaining new members. The Atlantic City convention promises to be more largely attended than any previously held by the electric railway interests, and while it is late now to make space arrangements, manufacturers who have not done so should send their applications promptly to the Manufacturers' Association.

Putting Wage Increase Up to the Legislature

The decision of the board of arbitration in the Albany wage case is one that may prove to be of far-reaching significance to electric railways in New York State. It holds in effect that while the general increase in the cost of living justifies an advance in wages, the earnings of the United Traction Company do not warrant the full increase asked by trainmen and that the fair remedy lies in the passage of an act by the Legislature that will enable the company to charge 1 cent for each transfer. While therefore recommending the 4 per cent increase, which is all that the earnings for the last year appear to warrant, the arbitration board suggests the substitution, if the Legislature should pass the enabling act, of a 10 per cent increase. Thus the decision puts the problem up to the Legislature. If the action of the arbitrators in the Albany case leads to legislation of the character indicated, it will undoubtedly initiate a movement in New York State for increased revenue which will correspond with the fight for higher freight rates, upon which the steam railroads of the country have entered, and will receive public consideration as one of the great business questions of the times. A charge for transfers has been successful in Massachusetts as a solution of difficulties arising from dangerous approximation of revenues and expenses, and a trial in New York State may prove its advantage as a remedy in another section of the country. Such a charge serves a two-fold purpose. It increases the railway revenue in a perfectly logical manner because, theoretically, there is an appreciable expense to the railway company every time a person transfers, and it should materially decrease the reasons for abusing the transfer privilege, because it reduces the margin between the cost of a fare when paid in cash and when paid by a free transfer.

Diplomacy in Negotiation

Undoubtedly many of the complaints brought against public utility companies by municipal politicians are made for political effect. To have a real abuse corrected is far less important in the minds of these men than to attract public attention to themselves as defenders of the community against alleged wrong or imposition. To such persons no discomfiture is so great as to have the tables so suddenly turned that instead of posing as the champions of the people they appear as if anxious to secure cheap political notoriety at the expense of the public. Such a case recently occurred in Jersey City, where the Hudson & Manhattan Railroad, after constructing a commodious entrance to one of its stations, was forbidden by the municipal authorities to open it until the company had agreed never to charge more than 5 cents from Jersey City to New York. Although the present fare is 5 cents, the company naturally did not want to bind itself forever to that rate, but the demand seemed a popular one to the Mayor, so he insisted upon it. The company replied with the counter proposition that the entrance should remain open as long as the fare remained 5 cents, but that it could be closed by the city whenever the fare was raised. This put the responsibility for the absence of a commodious entrance directly where it belonged. If the public is deprived of a convenience provided by the railway company the only ones to be blamed are the political officers who are trying to hit the company over the heads of the people.

Centers of Power Distribution

The location of power plants close to distribution centers is a well-established principle of engineering methods. In practical cases, however, it is frequently necessary to depart considerably from what is theoretically desirable, not only in original locations of power plants, but also when extensions of generating capacity are being made. The cost of locating a station a mile or two away from the load center is usually higher than is apparent on the surface, particularly in electric railway systems in which direct current is generated and transmitted at about 600 volts. In a recent instance the company's engineers determined that the line losses in a feeder transmission of only 2 miles from the generating plant to the distribution center amount to \$40,000 per year, the cost of current at the station switchboard being but 0.75 cent per kw-hour. This means that upward of 1,000,000 fares must be wholly devoted to paying for the unfavorable location of the plant each year before the rolling stock can be supplied efficiently with power from the proper point on the system to secure a minimum investment in subdivided feeders. With alternating current systems the restrictions of plant location are much less. The problem is complicated by the necessity for balancing many factors; but so far as the actual geographical distribution center is concerned the engineer has a pretty free hand in plant location. Even at the low potential of 2300 volts it is perfectly feasible to locate central stations of moderate size on the outskirts of a town; while the use of from 13,000 volts enables the plant to be placed from 5 to 10 miles away from the congested district without much difficulty. For this reason the company owning the direct-current plant mentioned above is enlarging its system by a new station three times as far away from the urban center as the existing plant is, but the use of alternating-current transmission at 13,200 volts, combined with a substation at the distribution center, solves the problem on the basis of good practice.

THE BROOKLYN RAPID TRANSIT REPORT

A review of the annual report of the Brooklyn Rapid Transit Company for the fiscal year ended June 30, 1910, shows a further increase in gross earning power and other facts, which suggest a consideration of the great changes effected in recent years in the financial results of operation of this large system.

From a comparative statement of construction expenditures for the fiscal years 1909-10 published in the report, it is evident that there has been a cessation in the heavy additions to capital investment which marked the early and middle years of this period. In the eight years beginning July 1, 1902, and ending June 30, 1910, a total of \$39,251,820 was expended for construction purposes, of which all but about \$3,000,000 was put into the property during the first six years. While the total expended in eight years, therefore, averages \$4,900,000 annually, the average for the last two years was but \$1,500,000 a year and the actual expenditure in 1910 fiscal year was \$1,181,000. About this amount was added to the floating debt as bills payable, which were \$3,400,000 on June 30, 1909, and were \$4,500,000 one year later.

A table in the report showing these large expenditures indicates that a little over three-quarters of the amount devoted to construction during the eight years was invested in track and roadway, power plant and cars and electrical equipment. The total of \$39,000,000 was divided among the different classes of property as follows: Right of way, 2.3 per cent; track and roadway, 19.8 per cent; electric line, 6.7 per cent; real estate, 2.9 per cent; buildings and fixtures, 10.1 per cent; power plant, 24.3 per cent; shop tools and machinery, 0.8 per cent; cars and electrical equipment, 32.2 per cent; miscellaneous equipment, 0.4 per cent; miscellaneous, 0.5 per cent.

Passenger earnings increased from \$12,321,265 in the 1902 fiscal year to \$20,477,145 in the last year, or an aggregate of 66.2 per cent. The largest increase in one year during the period was in 1906, when there was a gain of 12.38 per cent over 1905; the smallest was in 1909, when the gain was 0.68 per cent. No year failed to show an increase. Sixty per cent of the total passenger earnings in 1910 was received from the surface division, but in 1902 this division contributed 73 per cent. The elevated division has made much greater traffic gains than the surface division. It showed in 1910, as compared with 1902, an increase of 148 per cent in gross earnings, while the surface division gained in the same period 36 per cent. The actual relative importance of the changes in the two parts of the system is shown by the fact that of the gain of \$8,155,880 in total passenger earnings for 1902 to 1910, the elevated division furnished \$4,858,784 and the surface division \$3,297,096.

These changes in earnings do not measure the extent of the total traffic growth. The total number of passengers carried in the 1910 fiscal year was 569,438,773, a gain of 77 per cent over 1902. But of this amount 151,279,806 represented transfers redeemed and the increase in the traffic of this character in the same period was 123 per cent. If the transfer traffic is deducted from the total, the increase in the remainder of the traffic is found to be 64.8 per cent, or practically the same increase as shown in passenger earnings. Expressed in another way, the rate of increase in transfer passengers has been about double the rate of increase in revenue passengers.

Apart from these statements of general results, details of the disposition of operating earnings are given by percentages in an illuminating table. Of unique interest are those which pertain

to the costs of damages. In 1902 these costs amounted to 6.88 per cent of operating earnings, and in 1910 the expense chargeable to this cause had been lowered to 2.66 per cent of total operating earnings, a reduction in percentage which is rendered more impressive when placed in juxtaposition with the gain of 68 per cent in total earnings which took place during the period. President E. W. Winter comments in his remarks to stockholders on the decrease in damage and legal expenses and states that a further reduction also took place last year in the number of suits brought. Barring slightly over \$25,000 in judgments on appeal there is no outstanding judgment against any company in the system, a fact which is remarkable in so large a property.

The proportion of operating earnings expended last year in "general operating" expense as differentiated from repairs and renewals, damages and legal expense, was 35.52 per cent. This is the lowest rate of any year in the period under review and it is a material decline from the high point, 42.85 per cent, shown in the fiscal year 1902. Likewise, the total operating ratio of 56.09 per cent is the lowest of any year in the period, while the highest, 65.41 per cent, was reached in 1902.

Maintenance expenditures were the largest for any year and amounted to 16.16 per cent of operating earnings. This figure compares with 13.81 per cent in 1902 and with the low mark of 9.85 per cent in 1903. Total maintenance costs of \$3,377,990 for 1910 were divided between \$1,309,719 for way and structures and \$2,068,271 for equipment. The increase in maintenance expenditures in 1910 as compared with 1909 was \$493,000.

Charges for taxation are set forth in a separate table, which shows the payments for the different classes of assessment—real estate, special franchise tax on earnings, car licenses, capital stock, bridge licenses and Federal tax. The latter amounted to \$46,997, and the total for the year was \$1,454,213. This amount is equal to 6.8 per cent of total earnings for the year and is 96 per cent greater than the tax charges for 1902.

The report of the Brooklyn Rapid Transit Company stands as an exponent of a determined policy of publicity which we commend to other companies.

UNEQUAL BRAKE SHOE WEAR

The unequal rate of wear shown by brake shoes apparently exactly alike and operating under the same running conditions may be ascribed chiefly to two causes: inequalities in the shoe material and incorrect adjustment of the brake rigging. The variations in life are often of the most extraordinary character. Thus one company, with the same style of chilled shoes on a double-truck, double-end car, secured a life of fully 11,000 miles from one shoe and only 1900 miles from another. In this case the brake rigging had been very carefully adjusted so that the blame was placed on the foundry, and probably the assumption was correct, because for the price paid for these particular shoes the manufacturers could hardly have afforded to supply that homogeneity in structure which is the ideal of rail, wheel and gear makers. A remedy for this trouble, perhaps the only practicable one, is for the customer to buy his brake shoes on a straight mileage basis. Even this policy will not avoid the inconvenience of removing all of the shoes on a car while some are still useful, but it will avoid the waste of scrapping partly-worn shoes bought by the pound.

Nevertheless, it would be unfair to put all the onus for unequal brake shoe wear on the manufacturer. How many rail-

ways have taken the pains to prepare brake leverage diagrams covering their different equipments and have made up corresponding tables of the permissible stresses on the rods, levers and pins? It is erroneous to suppose that great engineering ability is necessary for these calculations for the leverage problems involved can be worked out by simple formulas. The trouble is that most of the smaller railways ignore the whole question of brake rigging. The cars may be received from the car builder with the rigging exactly right, but before long the conditions of service bring about a maladjustment of parts and leverage ratios which leads to poor distribution of braking effort. It is, therefore, essential that the braking rigging should not only be properly proportioned in the first place, but that it should be properly maintained. The latter work can be most effectively aided by the use of jigs to avoid all guesswork on the part of the shopmen in determining the proper distances between certain points on the braking levers. It should hardly be necessary to add that the safety of car operation is greatly enhanced when the brake rigging is given the right kind of attention in design and maintenance.

AVOIDING ELECTRICAL ACCIDENTS DURING CONSTRUCTION

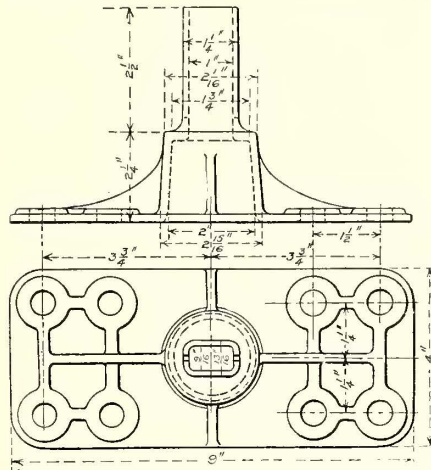
At no time is it more difficult to maintain safe and continuous service in a modern power plant than when portions of the building or equipment are undergoing changes during reconstruction or extension. When changes of this sort are under way, particularly in a plant where one side of the circuit is grounded, it may easily happen that an accident will occur through careless work, sometimes in the very act of trying to insulate apparatus for the protection of the construction force.

In a typical accident of this kind a new switchboard was being erected in a large railway plant on a gallery above the engine room floor. The old board was located on the floor and the two were tied together electrically by a strip of copper joined to each positive bus-bar. Some of the old panels were removed to the new gallery and additional panels were erected on the same site. About 50 lead-covered feeder cables were run out of the building from the positive bus-bars. To lessen the danger of shock from contact with the lead covering the live parts of the positive circuit to members of the construction force working around the plant the removal was directed of sections of the lead sheathing about 6 in. long from the cables run through the basement. This removal was accomplished by cutting circular channels around the cable coverings, connecting them with a horizontal cut, splitting down the lead and knocking off with a hammer. Upon the substitution of a screw driver for the hammer the former short circuited the conductor and sheath, with serious results.

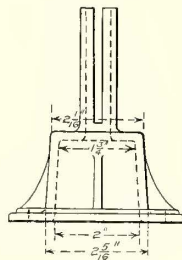
It is important to realize that sometimes even cables and terminals which have been disconnected from a live circuit will for a time retain a sufficient charge through electrostatic capacity to render severe shocks to careless persons. The stators of high-tension alternators are particularly susceptible to this condition, as are long cables of the armored type, the latter frequently retaining charges for several hours after disconnection. Extreme care in handling all high-tension circuits and apparatus, whether connected to live lines or not, is enjoined by the conditions of modern service.

BROOKLYN LINE DEPARTMENT—THIRD RAIL MAINTENANCE, HIGH-TENSION WORK, FEEDERS AND MISCELLANEOUS FEATURES

The preceding articles* on the line department of the Brooklyn Rapid Transit System have dealt with the different types of overhead construction and their maintenance. However, the activities of the line department also embrace the maintenance of a large mileage of third-rail construction; all high-tension and feeder wiring outside of the power plants and substations; all lighting and auxiliary circuits such as those used for signaling, telephoning and telegraphing; and the manufacture



Brooklyn Line Department—Base for Third-Rail Insulators on Brooklyn Bridge



Brooklyn Line Department—Standard Duck Bills for Single and Double Rail

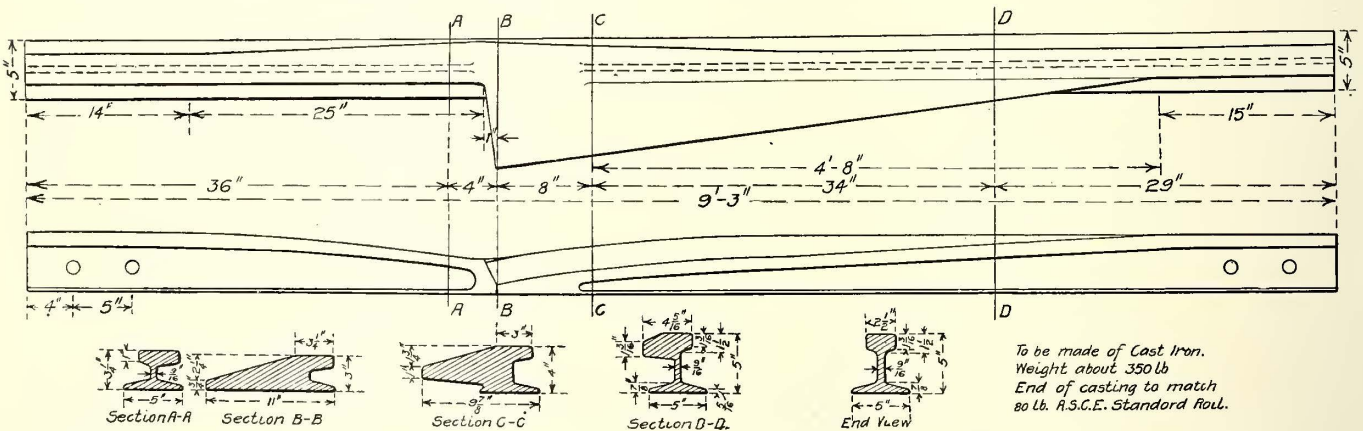
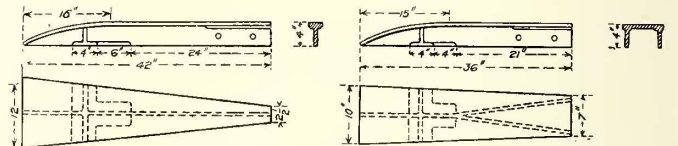
and testing of line materials. All of these additional subjects except the last will be treated in this article.

DETAILS OF THIRD-RAIL CONSTRUCTION AND REPAIRS

One of the accompanying drawings shows the standard third-rail base used on both the elevated and surface rapid transit lines. The base is made of malleable iron with an insulator of reconstructed granite or semi-porcelain secured to it with Dyckerhoff cement. The cement named has given

frequently such bent prongs would retard the natural movement of the rail. A side approach combined with a pair of "nosings," as shown on this page, is installed in some locations where it is not desired to cut the third rail and leave a gap. Gaps in the third rail are objectionable for many reasons, as they call for extra bonding and protection, and are points at which a defective contact shoe can begin to overthrow the third rail. The drawing on page 391 shows both right- and left-hand third rail switch wings (with extensions) used for side approaches at places where it is not desirable to cut the rail. The offsets can be cut away at the end with a chisel if the curve is concave or at the middle if the curve is convex. Wooden approach blocks are spiked to the ties at the ends of the rail so that defective shoes cannot get under the third rail.

Another drawing on page 391 shows the scheme used where gaps are not so objectionable. It will be observed that the third rail has been bent and dropped so as to provide clearance between the top of the rail and the lowest position of the contact shoe. The rail is then bent up to get into alignment with the standard location. This avoids costly bonding and still provides a very rigid type of construction. This scheme is not applicable, of course, to places where there are switch rods or other obstructions to prevent the rail being dropped so close to the ground. A peculiar form of nosing



To be made of Cast Iron. Weight about 350 lb. End of casting to match 80 lb. A.S.C.E. Standard Rail.

Brooklyn Line Department—Combination Third-Rail Wing and Nosings Used to Avoid Gaps at Side Approaches

much better results than compounds containing sulphur or similar ingredients. Attention is called to the use of eight holes in this base. This number is required in order to secure a fastening whether the base is turned cross-wise to the tie or in any other direction. Usually only two lag screws are needed, but the variations in the position of the guard rails on the elevated structure call for many different methods of lagging the base to the tie. The insulator cap is of cast iron with wrought-iron prongs cast into place. These prongs are seldom bent over, as it has been found unnecessary, and

crew has a wagon for additional supplies, as it is impracticable to carry supplies on the elevated structure. This latter practice involves the liability of interfering with the regular movement of passenger trains. While it does cost a little more to have one man stay in the street to watch the supplies and hoist them up on the structure, there is less danger of dropping things into the streets and there is no interference with trains or loading up of platforms.

HIGH TENSION OPERATING RULES

The standard high tension transmission voltage of the Brooklyn Rapid Transit System is 6600 volts, three phase, 25 cycles. The company has in effect the following tag system

* See ELECTRIC RAILWAY JOURNAL June 11, June 18, July 23 and Aug. 20, 1910.

to protect employees working on high tension or low tension circuits:

Any employee desiring to work on the high tension lines or apparatus must notify the chief power operator, stating exactly what he wishes to do. The chief operator then takes up the matter with the man in charge of the power or substation in connection with which the work is to be done. If, in the opinion of the chief operator, the work will interfere with the proper operation of the system, and if the party desiring to do the work so requests, he will take the matter up with the superintendent of power.

If the work is to be done, the chief operator calls up the man in charge at each power and substation where precautions should be taken to prevent injury to the men who are to do the work. The chief operator instructs these men to fill out and attach in a substantial manner a tag to all switches, by which it would be possible to make alive the circuit or apparatus on which the work is to be done.

The man who makes out the tag must write on it the following information:

Name of power or substation.

Name of man requesting that tag be put on.

Name of man who puts the tag on.

Date, hour and minute when tag is put on.

The chief operator must be notified as soon as the tags are in place. On being informed that the circuit or apparatus has been properly tagged, the chief operator notifies the man ordering on the tags that the circuit or apparatus, specifying the name and number, has been tagged in his name, stating the points where the tags have been put on.

To avoid mistakes, those who put on the tags must inform the party ordering on the tags that they have tagged a circuit or apparatus of certain number in his name, also stating at what points this was done. For the proper operation of this rule it is necessary that the party ordering on the tags, after having first advised the chief operator of his desire to work on the circuit or apparatus, shall not mention the number of circuit or apparatus until the chief operator and the parties putting on the tags have advised him that the circuit or apparatus of certain number has been tagged in his name and the same has been found to agree with his request to the chief operator.

The man in charge of the work to be done, after having been advised by both the chief operator and the party tagging

until ordered off by the chief operator. The chief operator then notifies the man in charge of the power or sub-station at the points where the circuit or apparatus is tagged to remove the tag as soon as it has been ordered off by the party who ordered it on originally.

When the tag thus has been removed and the order has been approved by the chief operator, the man in charge removes the same, writing on it plainly the following:

Name of man by whom the tag was ordered off.

Name of the man who removed the tag.

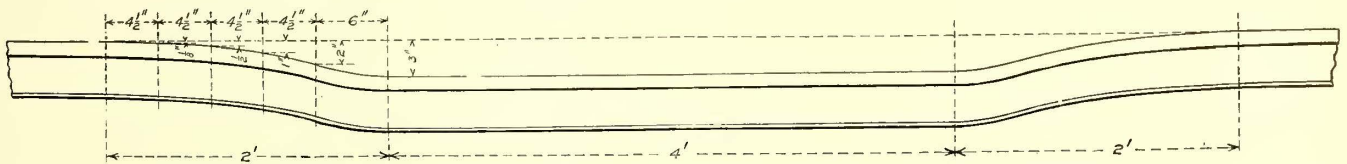
Date, hour and minute when tag was removed.



Brooklyn Line Department—Third-Rail Switch Wings, Right and Left

Upon this, the chief operator is advised of the time of the removal.

All tags must be removed as soon as possible, and under no conditions must any circuit or apparatus be left tagged when in condition for service, except when work is actually being done upon it. If necessary for the party ordering on the tag to leave the job and turn the work over to another he must see before leaving that his successor orders on his tags, after which he orders removed the original tags in



Brooklyn Line Department—Method of Bending Down Third Rail at a Cross-Over

the circuit or apparatus that the same is dead and properly tagged in his name, proceeds with his work, first taking the precaution to test and discharge the circuit or apparatus. While working on the same, if practicable, the three phases are jumped together and grounded by a jumper of at least a No. 4 B. & S. wire.

As soon as the work is completed the man (only the man whose name appears on the tag) ordering on the tags instructs the chief operator and man in charge at the points tagged that the work is complete and the circuit or apparatus is clear and ready for service, but no tags must be removed

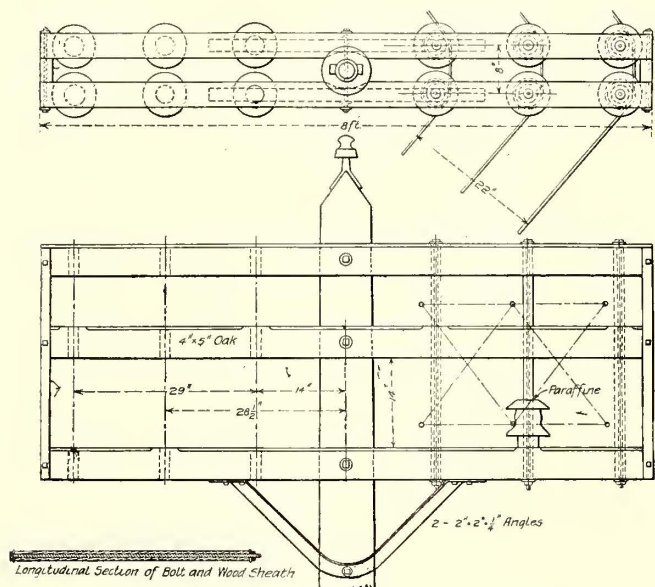
his name, i.e., no one must leave any circuit or apparatus, which could possibly be used in case of emergency, tagged in his name except when he may be reached by the chief operator by telephone. On each Sunday the tags that have been used during the previous week are sent to the chief operator's office for checking and filing.

For ordinary work on circuits or apparatus, where the same must not be made alive at any time, a "red tag" is used; i.e., the circuit or apparatus is not to be made alive under any conditions, and any number of men can work on the same at one time, having first ordered on their "red tags" as provided.

For high-tension tests of any work, where it is necessary to make the circuit or apparatus alive, either with high-tension or low-tension current, a "blue tag" is used. When a "blue tag" appears on a circuit or a piece of apparatus it is considered alive at all times, except by the party whose name appears on the tag, who has exclusive use of the same.

No "blue tag" can be ordered on a circuit or apparatus already tagged with a "red tag" or "blue tag."

No "red tag" can be ordered on a circuit or apparatus already tagged with a "blue tag."



Brooklyn Line Department—High-Tension Pole Head at Canarsie Substation

However, a "red tag" may be ordered on a circuit or apparatus already tagged with a "red tag."

The superintendent of power, superintendent of line department and general foreman of power and substation construction must furnish the electrical engineer with a list of the men under them who are authorized to order circuits or apparatus tagged, and must certify that all of the men on the list have received a copy of these rules with a print of the high-tension feeder system, and that they understand the same. These lists, after being approved by the electrical engineer, are furnished to the chief operator, and only the men who have been approved by the electrical engineer have the right of ordering the feeders tagged.

The chief operator must immediately cross from the list of those authorized to order circuits or feeders tagged the name of anyone failing to strictly comply with the foregoing rules, and must at once notify, in writing, the electrical engineer and the head of the sub-department in which the party belongs. Any name cut from the list, as provided for above, can only be restored by order of the electrical engineer. Failure to comply with the high-tension rules is a cause for immediate discharge from the service of the company.

In case an unauthorized party desires to work on a circuit or piece of apparatus, his tag may be ordered on by any authorized party, who is responsible for him; but in no case must his tag be removed, except on his own order to the chief operator and the parties tagging the circuits or apparatus.

In all work on low-tension circuits or apparatus, the same

are considered alive at all times, or in case this is not practicable, the rules covering high-tension circuits or apparatus apply and must be strictly complied with. The following form relative to the receipt and understanding of the rules is signed by every man working on high-tension and low-tension circuits, and is certified by the superintendent of power, the superintendent of the line department or the general foreman of power and substation construction:

TRANSIT DEVELOPMENT COMPANY
ELECTRICAL DEPARTMENT

.....19..

This is to certify that I,,
employed as at the
have received a copy of the Rules for the Protection
of B. R. T. Employees Working on H. T. and L. T.
Circuits or Apparatus, effective Nov. 1, 1906, which
I have carefully read and fully understand.

Signed:
.....

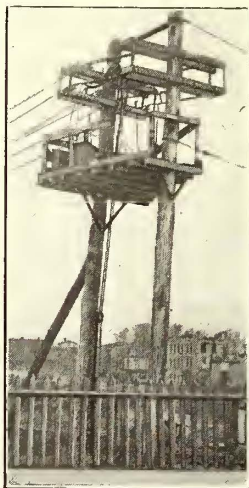
I hereby certify that I have examined the party
named above and find that he fully understands and is
familiar with the rules referred to.

Signed:
.....

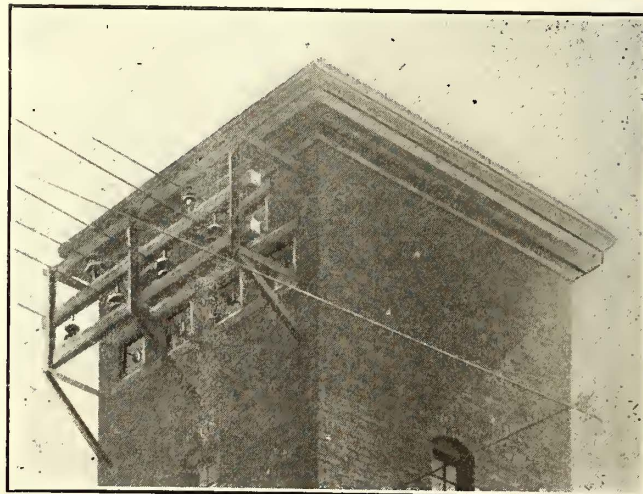
HIGH-TENSION CONSTRUCTION FEATURES

The half-tone in the opposite column shows one of the methods used to bring three-conductor, 6600-volt No. 0000 paper-insulated and lead-covered cables up a pole for connection to aerial transmission lines. For a distance of about 7 ft. from the ground, the wires are encased in wrought iron pipe and then are brought to a lead pothead which is wiped to the sheath. From the top of this pothead, rubber-covered leads are taken and connected to the aerial lines. The lead sheaths of the individual leads are wiped securely to the pot-heads to make a water-tight joint. The lead is stripped back a liberal distance from the point of contact with the aerial lines and the rubber is served with layers of gum tape and a good insulating varnish. This arrangement has proved very satisfactory. The lightning arresters at the installation illustrated are of the G.E. type; they are mounted in a box on the platform.

The drawing on this page shows the standard high-tension pole head for turning corners. It is made long enough to



High-Tension Lines and Pot-Head



Brooklyn Line Department—High-Tension Entrance at Coney Island Substation

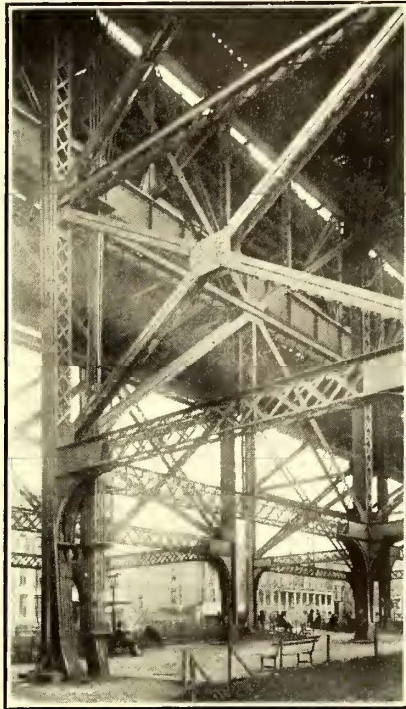
provide the same space between the wires as exists on tangents after the arms have been placed at the proper angle to resist equally the stress from the wires turning the corners. It will be noted that 1/2-in. iron bolts have been inserted in the wooden pins which pass through the middle of the cross arms to tie them together top and bottom. This makes an exceptionally

strong construction. The insulators are inserted as shown, and the space between the pin and the insulator is filled with hot paraffin.

The standard entrance for high-tension wires is presented in the view of the Coney Island substation tower on page 392. It consists of a steel frame supporting cross arms between which insulators are set, as shown, so as to take the strain of the wires. The latter are then led directly through the center-perforated double glass windows of the tower. The lightning arresters are mounted inside the tower, and the wires are brought together in a lead-covered cable terminating into a pothead at both ends and leading into the substation and oil switches.

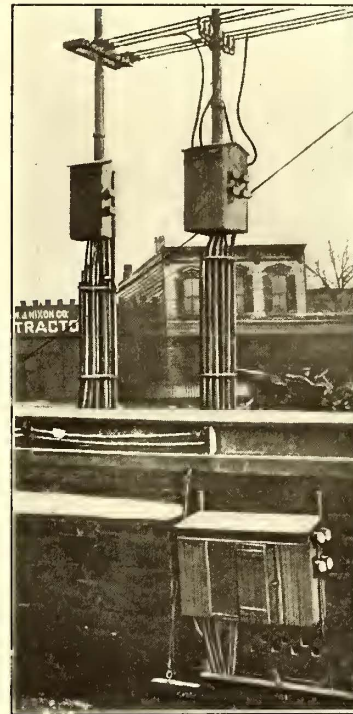
SOME D.C. FEEDER INSTALLATION FEATURES

Where d.c. wires are brought out underground from the substations to the aerial feeders, they are protected in their course up the pole by means of iron pipe to a height of 12 ft. to 15 ft. above the sidewalk level, and bushings are provided at the end of the pipe. The cables are carried across the street and vertical jumpers are installed to connect the longitudinal feeders on the street with the transverse feeders from the substations. This permits any desired rearrangement to be made at small expense. The Hudson Avenue substation, whose feeder arrangements are shown in one of the illustrations on this page, has provision for an ultimate capacity of 10,000 kw. plus the overload ability of the machinery. At the Bridge

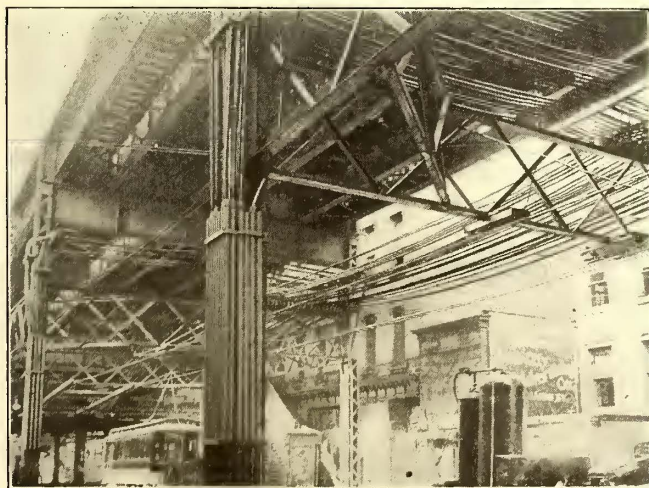
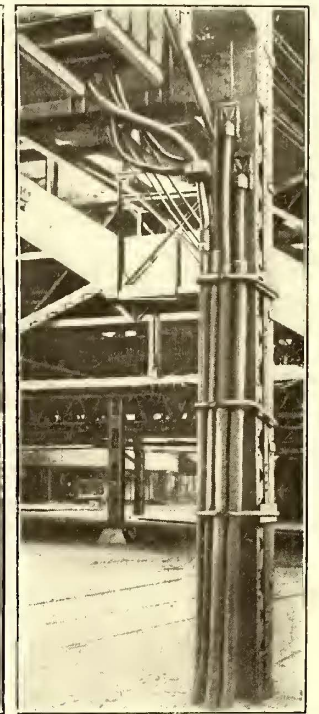


Vertical Feeder Run Under the Williamsburg Bridge

using a ladder, a small platform is provided except in rare cases, where it would be impossible to install one. The drawing on page 394 illustrates how a cast-iron joint is made between the underground tile ducts and iron feeder pipes run up a column of the elevated structure or elsewhere. The square tile duct costs only 5 cents per foot, whereas iron pipe costs 30 cents per foot. Thus the duct permits a saving.



Aerial and Third-Rail Feeders, Negative Feeder Cables on "L" Structure Brighton Beach Cut



Brooklyn Line Department—Feeders in Front of Bridge Substation



Brooklyn Line Department—Feeders Led up Pillars on Both Sides of the Street at Hudson Avenue Station

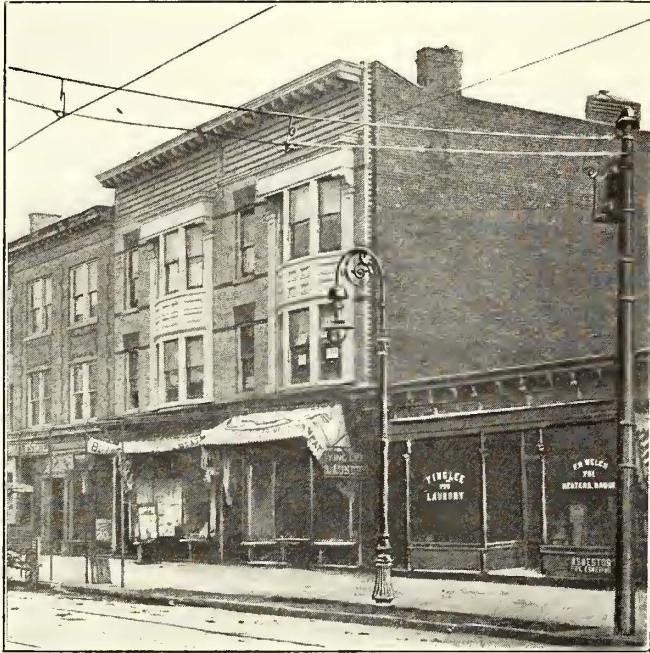
substation there are outlets for a rated capacity of 13,000 kw. In this location, cut-out switches are provided a short distance away, so that the cables may be tested regularly. These switches are placed in a dry spot, where they can be readily inspected and manipulated. In order to handle the switches safely under the elevated structures, that is, without

portion of the runway illustrated is fully 110 ft. long. The center view at the top of page 393 pictures the method used near the Prospect Park substation for bringing out feeders from the substation to reach the aerial line and the contact rail of the Brighton Beach line in the cut below. A separate manhole is located at the foot of each pole. The cables are

brought up through pipes into the pole boxes and thence joined to the aerial feeders. The contact rail feeders are brought directly to the boxes in the retaining wall, as shown. The trolley switches are mounted in the boxes just above the cables. These boxes contain the necessary switches for disconnecting and testing the feeders. The view opposite the one described shows the manner of connecting negative cables to the elevated structures. The cables are soldered into a

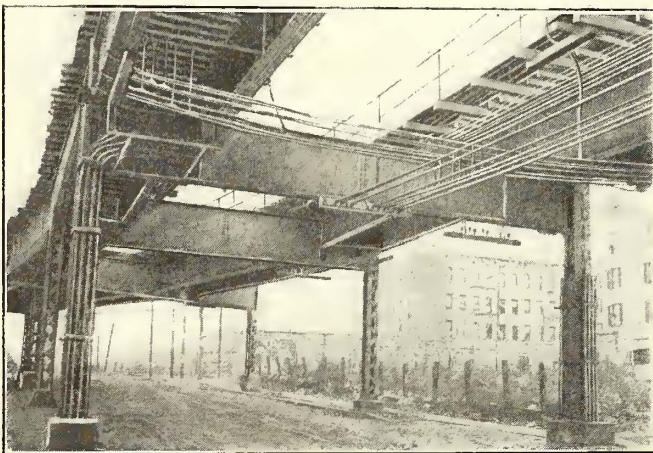
90 ft. They are encased in metal pipe for about 15 ft. above ground. There is also cleated to one of the bridge columns a 6600-volt cable which is served with asbestos and steel tape.

One of the cuts on this page shows the feeder connection from the Parkville substation to the third-rail on the Brighton Beach line. The cables, which are of braided, varnished cambric, are brought out in wooden boxes filled with tar. Connection is made to the third-rail by a copper terminal, which



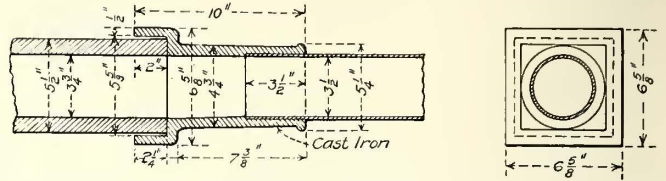
Brooklyn Line Department—Side Feed on Flatbush Avenue

large terminal of copper, which metal is used in preference to brass because of its higher conductivity for a relatively small additional cost. The terminals are sweated to the elevated columns, which have previously been cleaned and tinned; they are bolted to the columns and soldered while hot, the whole forming a very durable and satisfactory connection. It has been found that the riveting between the elevated columns and the girders is in itself sufficient to carry the return current with no perceptible heating of the conductors.



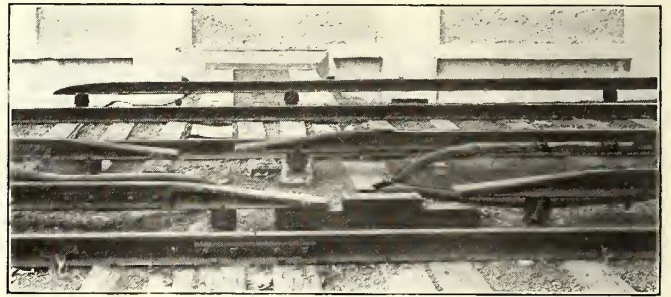
Brooklyn Line Department—Transverse and Longitudinal Feeders with Jumpers and Switch-Box Platform

The unusual vertical d.c. feeder installation under the Williamsburg bridge is shown on page 393. The cables, which are of varnished cambric, are brought for one-half mile underground in clay ducts from the Eastern power station of the Brooklyn Rapid Transit System, and are carried up for about



Brooklyn Line Department—Cast-Iron Joint for Wrought-Iron Pipe and Tile Duct

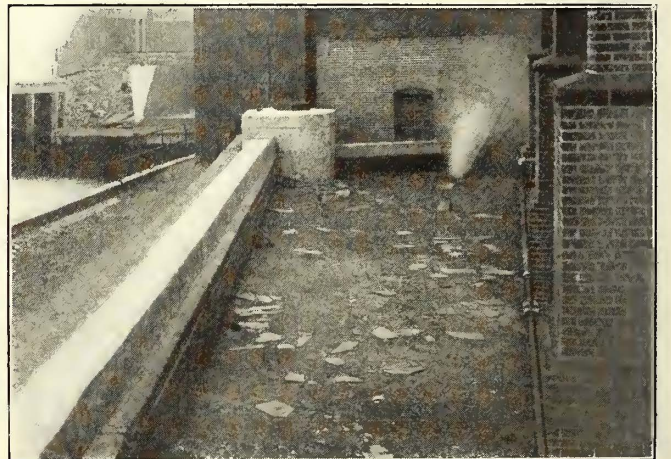
is bolted and sweated to the rail and bolted and sweated to the cable. The third-rail is sectionalized opposite the substation. The small rail appearing in the background is a con-



Brooklyn Line Department—Feeders from Parkville Substation to the Third Rail

tact signal rail which has nothing whatever to do with the feeder connections, but is used for station signals.

The Flatbush Avenue view shown on this page represents the standard method of attaching a side-feed to the trolley wire. This differs from the common practice of making a side-feed act also as a span wire. The latter method is unsatisfactory because the strands have the tendency to break at the connections. Again, in case the trolley wire breaks and comes in contact with the rails, the short-circuit will often heat the

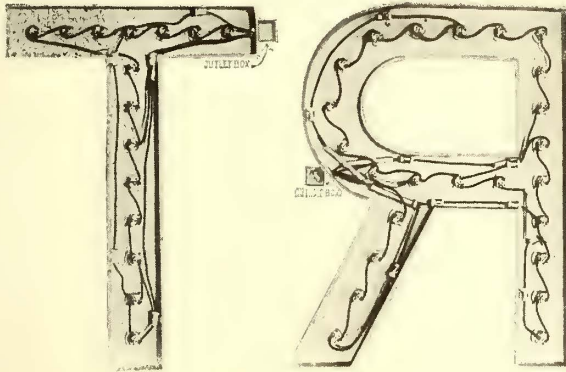


Brooklyn Line Department—Combined Low-Tension and High-Tension Concrete Duct at Second Avenue Plant

wire, and, combined with the mechanical load of the trolley wire, will cause the side-feed to fall, thereby dropping more wire to the streets and causing a further loss. With the Brooklyn type of construction, which is being applied on all new work and replacements, the side-feed performs no other

function than that of supplying current to the trolley.* The ultimate cost, considering maintenance, is believed to be less with this type of construction than with the other. The connection between the underground cable and the feeder is made by a small quick-break knife switch, so that the underground cables may be easily disconnected for inspection and testing. In case the cable feeder gives trouble, it can be quickly cleared from the trolley wire.

THE REPAIR OF LIGHTS AND AUXILIARY CIRCUIT WORK
An emergency branch of the line department is organized to



Brooklyn Line Department—Wiring of Coney Island Terminal Sign Letters

take care of the lights. All outside incandescent lamps, such as those which are suspended over the tracks, on platforms, over crossings, in terminals and yards where extension lad-

four horses were needed, and even this force was unequal to the task in hot weather and when repairs were heavy.

Ordinarily, the arc lamps are maintained by two men, but in the summer, when extra lights are used at the beaches,

REPORT ON LIGHTS					
INSTALLED					
FROM	TO				19
LOCATION	AUTH. OR REQ. NO.	SINGLE LIGHTS	5 LIGHT CLUSTERS	10 LIGHT CLUSTERS	ARC LIGHTS
REMOVED					
Total Lights Connected on System.		Incandescent.			
Lights Removed on Account of Breakage:		Arc.			
" Burned Out.					
" Stolen.					
Supt. of Line Dept.					

Brooklyn Line Department—Lighting Crew's Report Blank

more hands are employed. In all, the department maintains 57,000 incandescent lamps and 425 arc lamps. Its policy is to light the yards and buildings so well that not only are the

TELEPHONE CALL SHEET, FOR TROUBLES ON ELECTRIC LIGHT, SIGNALS, TELEPHONE AND TELEGRAPH									
WEATHER		A. M.	P. M.	DATE					19
No.	LOCATION	NATURE OF TROUBLE		CALLED BY	ANSWERED BY	REPAIRED BY	TIME REC'D	TIME REP'D	REMARKS
1									
2									

Brooklyn Line Department—Portion of Sheet Used at Nostrand Avenue Headquarters for Emergency Calls

ders are required, are maintained by a crew of three men, which usually is on duty from 6:30 a.m. to 5:30 p.m., but longer in bad weather. Emergency calls for the repair of lights are always answered as soon as possible, and are not allowed to go over until the next day. The crew is furnished with an automobile of the type illustrated, which enables it to

employees enabled to do good work at night, but night prowlers are also deterred from stealing material. There are 6900



Brooklyn Line Department—Iron Bar and Feeder Construction on Flatbush Avenue

cover 80 to 90 miles a day, with runs extending between such distant points as Bowery Bay and Coney Island, which are about 25 miles apart. The automobile has proved a great success in this service, as formerly four men, two wagons and



Brooklyn Line Department—Automobile for the Lighting Repair Gang

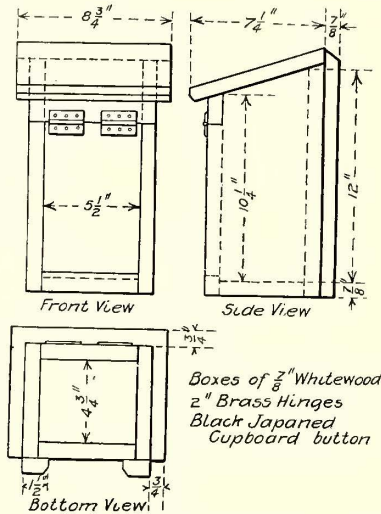
lights on the elevated stations, which are cared for by two men, on duty from 12 noon to 12 midnight. Care has been taken to have separate sources of supply in the lighting of all important localities. Thus, at the Brooklyn Bridge power is

available from three independent sources, and there are two separate circuits at all other stations.

The lighting force of the line department also takes care of the display signs at the Coney Island terminal. All of these signs are of metal, and are grounded. There are many difficulties in properly maintaining them because they are operated on a 550-volt railway circuit in the damp, salt air near the seashore. It is therefore necessary that they should be made with a high-grade insulation, which is of the Brooklyn Heights standard 600-volt grade.

The ease of repair must also be considered, as the sockets are liable to burn out, and the signs must be as nearly water-tight as possible, to avoid short-circuits. The lamps can be twisted and taken out from the front of the sign. Wherever possible, each letter of the sign is provided with a suitable outlet box and cut-out. All inflammable material is excluded. The lamp bases are of porcelain.

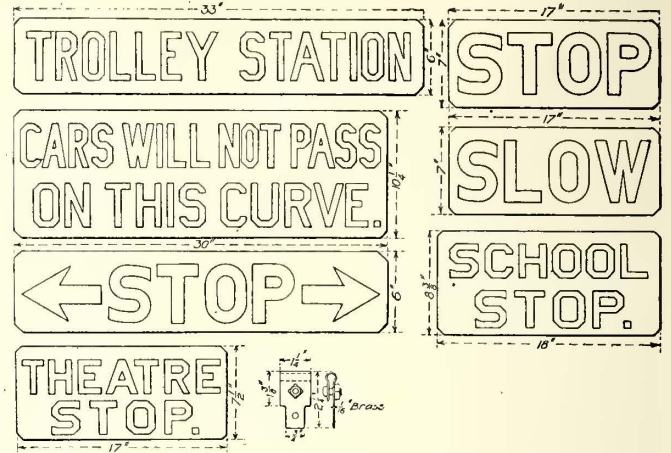
The drawing herewith shows the standard pole switch-box for street lights and clusters. The boxes are not insulated inside, as they never are used inside of buildings. While it is believed that cast-iron boxes could be made which would give as long life, the difficulty of insulation and the danger of injury to persons handling the switches is practically eliminated by using wood. Whitewood boxes of the size shown, fitted with brass hinges, are made for \$1.25 each. The boxes are mounted on the



Brooklyn Line Department—Pole Switch Box

the main office, dispatcher's office and the principal elevated stations. All of the instruments are operated through a bank of multiple-series lamps from 550 volts, thus doing away with the maintenance of bluestone batteries and giving an extremely reliable method of operation.

The emergency calls for all telegraph, telephone, signal and third-rail work are assigned by the telephone operator at the line department headquarters, who is furnished with a record sheet similar to that used for the emergency line work. A

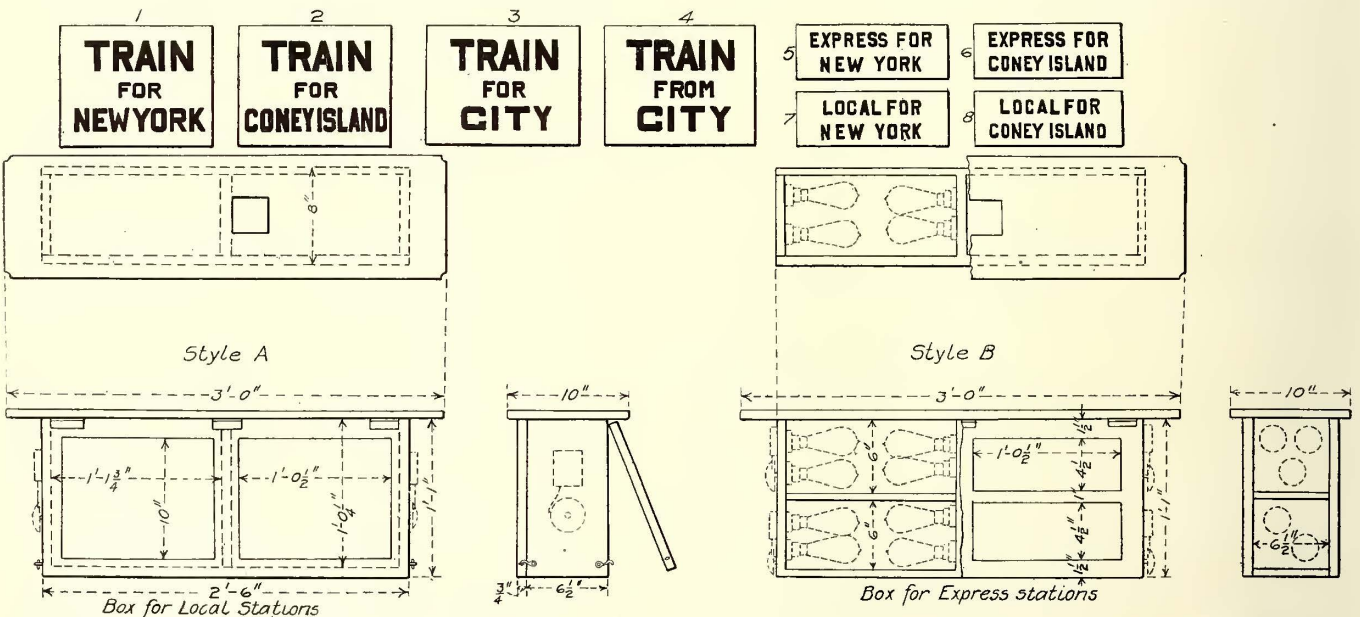


Brooklyn Line Department—Enameled Trolley Signs with Non-Rusting Fittings

record book at the line headquarters contains full details of bells and lights and highway crossing track signals, etc., so that supplies for a given point can readily be furnished without mistake. There is also a permanent light and inspection form for all lights outside of power and substations, including switch-box covers, etc.

OVERHEAD LINE SIGNS

The company has recently given up the use of painted sheet-



Brooklyn Line Department—Electrically Illuminated Train Announcers Used in Connection with Gongs at the Stations on the Brighton Beach Line

poles about 5 ft. to 6 ft. above the sidewalk, and therefore are out of the reach of children.

AUXILIARY CIRCUITS

A crew of four men cares for the telegraph and telephone circuits; also signals, such as train announcers, warning bells and the waiting room indicators, like those used on the Brighton Beach line showing the destination of the approaching train. The same gang looks after the fire alarm circuits. Telegraph instruments are used on the Brooklyn system in

iron signs for line marks, such as theater stops, school stops and the like. It is now using for this purpose heavy enameled signs which have white letters on a blue background on both sides. Brass hangers and bolts are used, so that there is no rusting to disfigure the signs after they have been in use for some time. The signs are fastened to the spans, so as to avoid swinging, thereby preventing the wearing off of the span galvanizing and the consequent streaking of the sign by rust. Enameled ware of this kind can be bought in the open market.

TRAIN OPERATION ON THE DAYTON & TROY

The Dayton & Troy Electric Railway Company operates a high-speed interurban road between Dayton and Piqua, Ohio. This line is 32 miles between terminals and is double-tracked for approximately one-half the distance. The service includes eight limited trains daily, which are operated in connection with the Western Ohio Railway and the Toledo, Bowling Green & Southern and make the 162-mile run between Dayton and Toledo in six hours. Hourly local service is given on the Dayton & Troy in addition to the limiteds and the company is building up a substantial freight traffic.

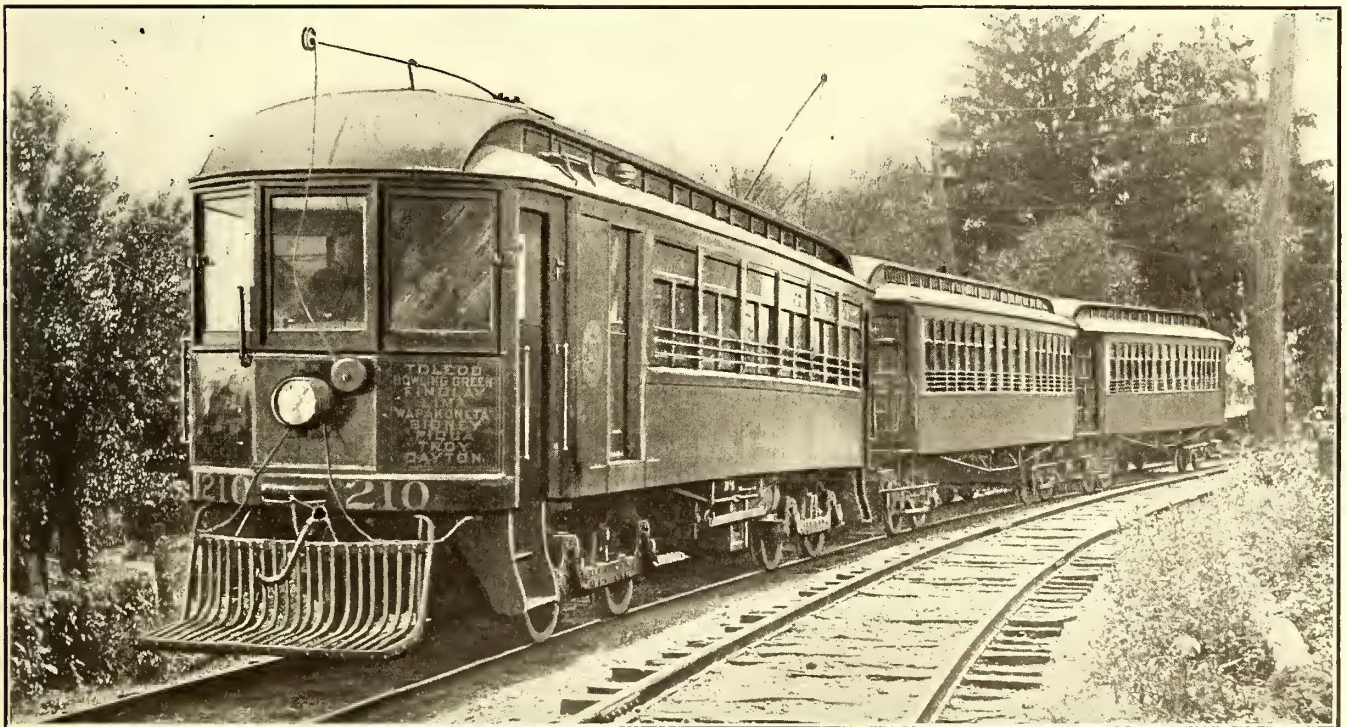
The growth of the passenger business has brought about the need for shortening the headway, which now averages 45 minutes, or increasing the number of cars in the trains as now scheduled. The alternatives which presented themselves were either to increase the number of trains so that they would operate on a 25-minute headway or run two-car trains. Because of the operating economy in the latter course, as well as the reduction in hazard on account of fewer trains, it has been decided to attach trailers to the present trains. Accordingly five single coaches formerly operated on the New York, New Haven & Hartford Railroad were purchased recently and have been rebuilt for trailer service. These coaches are practically the same size as the present interurban car bodies which will haul them. C. M. Paxton, general manager of the Dayton & Troy, states that if the experiment with these coaches warrants

house schedule AMM automatic air-brake equipment with graduated release. These cars are being operated on a schedule requiring a run of 31 miles in 1 hour and 25 minutes, and making 12 station stops in addition to country pick-up stops. A crew of three men is used in handling a train. The trailers are connected with the motor cars by an electric signal circuit so that no cords are used, and a lighting bus is provided for furnishing current to the lamps in the trailer. The seating capacity of a train of one interurban motor car hauling one of these rebuilt trailers is 97 passengers and the trailers have a large capacity for standing passengers. The operation of these two-car trains has shown that the time lost in accelerating with a trailer is more than made up by the time gained in loading with two entrances; and ordinarily the two-car train makes the run as quickly as a single interurban unit.

TRAUMATIC NEUROSIS

This subject was discussed in an address by Hon. Henry J. Booth, chief counsel, Columbus Railway & Light Company, before the North Side Medical Research Society several months ago. The address has been reprinted by Secretary Donecker under the title of "Street Railway Accidents" and has been sent to all members of the Claim Agents' Association. Mr. Booth laid down the following conclusions which he had reached in regard to traumatic neurosis:

1. Such claims are more frequently made in connection with



Train of One Motor Car and Two Trailers on the Dayton & Troy Electric Railway

continuation of the service new equipment specially designed for train operation will later be purchased.

In overhauling the coaches preparatory to putting them into trailer service the platforms were rebuilt and four angles 4 in. x 3 in. x 5/8 in. in section were added to the old structure for carrying the couplers, which are of the Tomlinson M. C. B. type and weigh about 450 lb. each. The couplers are so installed that there is a space of 12 in. between the buffer bands. New steel body bolsters were placed under the cars and the bodies were raised to conform to standard steam coach height. In addition to rebuilding the platforms and adding the couplers, the interiors of the cars were overhauled and the bodies were painted. In all about \$500 was expended in preparing the old steam coaches for interurban trailer service.

The interurban motor cars which pull the trailers are equipped with four Westinghouse Nos. 76 or 112 motors and Westing-

injuries to women than in connection with injuries to men.

2. These symptoms are far more common and more lasting when the accident results in litigation than when it does not.

3. When such symptoms are made the basis of a claim for damages they almost invariably disappear when the claim is settled or the litigation ended.

4. Such symptoms are far more persistent when the patients are under known observation than when they are not.

5. Neurasthenic patients are extremely susceptible to the suggestions of physicians, friends and attorneys, and sometimes the border line between the conscious and unconscious acceptance of such suggestions is extremely difficult to define.

6. Osteopaths do far more to remove such cases from the domain of "the vague, the mysterious and the obscure" and bring them into the light of real scientific diagnosis and treatment than the old-line physicians.

THE SOCIAL AND ATHLETIC ACTIVITIES OF SAN FRANCISCO ELECTRIC RAILWAY EMPLOYEES

On Jan. 1, 1909, the employees of the United Railroads of San Francisco organized the United Railroads Athletic Club to promote amateur athletic contests and entertainments. Later the club was incorporated as the Railroad Athletic Club. The officers are: H. T. Jones, president, superintendent of the Fillmore division and also of the employment bureau; vice-president and treasurer, G. F. Chapman, superintendent McAllister division; secretary and match maker, W. A. Nugent, assistant to Mr. Jones; physical instructor, Professor G. W.

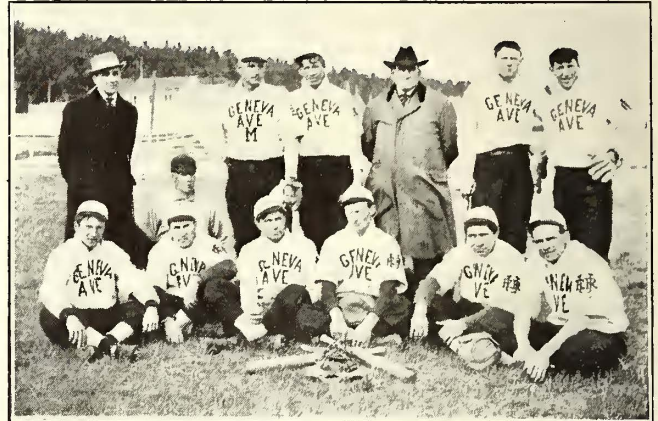
of \$4,500. They include a combined reading and writing room, with a library of about 300 volumes and files of the popular magazines and newspapers. A piano is also placed in this room for the use of musically inclined members. Other rooms are used for pool and billiard games, for hot and cold water tub, shower or needle baths, for massage tables, for a gymnasium and for a handball court. A constant supply of fresh air is supplied to the gymnasium by a 4-ft. fan driven by a 10-hp motor. The club rooms are appropriately furnished with pictures of noted athletes and with advertising placards for which a rental charge is made by the club.

In the center of the gymnasium, which is turned into an arena



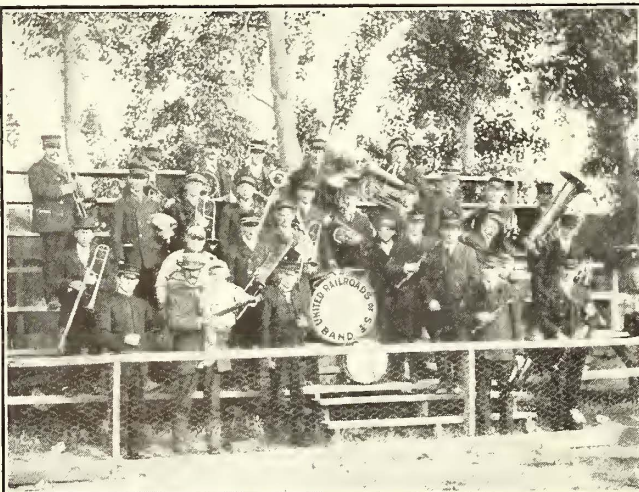
San Francisco Employees—The Shop Team and Its Kid Mascot

Braun, champion professional welterweight wrestler of the world. In addition, the club also has a referee and judges. Salaries are paid only to the physical director and the janitor. The membership is composed of a large percentage of the 3000 employees of the railroad company, but there are also a few outsiders. The initiation fee is \$1, with monthly payments of 50 cents. Each member has a monthly membership card and also a pass key to the clubhouse. The officers of the United Rail-



San Francisco Employees—Baseball Team of the Geneva Division Car House

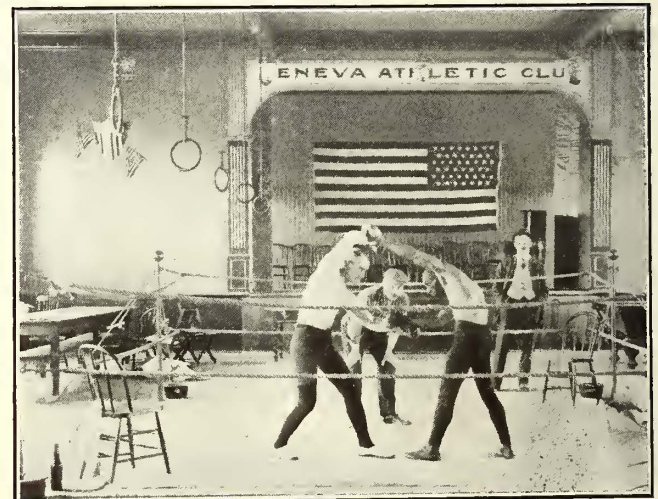
on show nights, there is a 24-ft. Queensbury elevated boxing ring which is said to be the finest on the Pacific Coast. The seating capacity of the gymnasium arena is 1500, but the exhibitions given have proved so popular that, during the past year, it was found necessary to hold the bouts at Dreamland Pavilion, where there has been an average attendance of 3000. When the boxing shows were first given the admission fee was 50 cents and reserved ringside seats cost \$1 each, but these prices



San Francisco Employees—The Brass Band Preparing to Entertain at a Baseball Game

roads of San Francisco are honorary members. Three of the car houses have auxiliary organizations, one of which is known as the Geneva Athletic Club. All of these organizations are devoted to both social and athletic purposes, boxing and dancing being among the principal entertainments.

The Railroad Club is centrally located at Turk and Fillmore Streets, on the upper floor of a large two-story wooden building owned by the United Railroads. The company gives the free use of these quarters, as well as light, heat and water. The large, well-ventilated club rooms were fitted up at a cost



San Francisco Employees—A Friendly Bout Between Black and White

have been raised owing to the popularity of the club. Those who participate in the bouts are either amateurs or semi-professionals, most of the boxers being bonafide members. As a general rule, the contests are restricted to three or four rounds. Cash prizes are prohibited, but the winner of a boxing contest is given a merchandise order not to exceed \$35. These prizes are sometimes divided as per agreement between the contestants. These boxing contests are held in accordance with the monthly license practice which prevails in San Francisco.

Banners, medals and cups are presented to winners of

contests in wrestling, running, baseball, basketball and pool. It is an interesting fact that many of the club's best athletes are among the most reliable employees of the company. The division superintendents say that they have less trouble with their pugilistic platform men than with most of the others. Several good Marathon runners have been developed by the club, the foremost being a Greek. During this season two pool tournaments were given by the club and two large silver cups were presented to the winners.

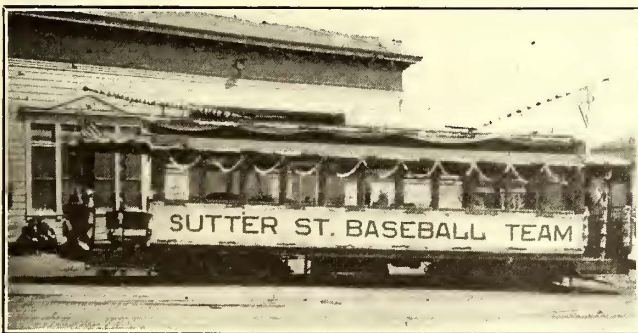
The railroad company has manifested a great deal of interest in the club's welfare, so much so that the president, Patrick Calhoun, has favored the building by the company of



San Francisco Employees—An Inter-Department Baseball Game

a new clubhouse with a finer gymnasium and auditorium. A year ago the club was presented with a billiard table by Dr. W. B. Coffey, chief surgeon of the United Railroads Hospital Association.

During the winter free dances have been given by the club at its gymnasium, the music being furnished by an orchestra composed of employees of the United Railroads. Baseball is a favorite pastime. All items of the equipment, such as uniforms, bats, balls and bases, are furnished by the company. Even special cars are supplied to transport the teams and rooters to the ball grounds. Nine divisions, including the general offices and shops of the company, send strong teams into the field to compete for the championship of the United Railroads baseball league. These inter-department games are keenly fought. Every team has a mascot and plenty of loyal followers with cheering choruses, just like the college baseball and football clubs. An all-star team is selected from the com-

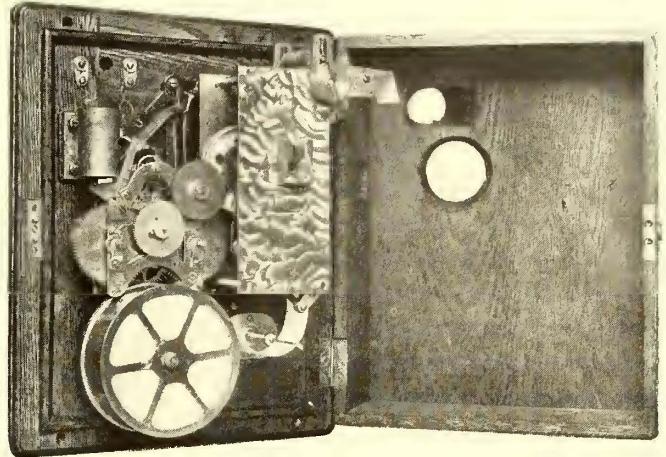


San Francisco Employees—Special Baseball Excursion Car Provided by the Railway

pany's nines to enter the Bay Cities League, a San Francisco organization of high-class amateur baseball teams. The pennant prize in this league last year was a large silk banner contributed by a prominent sporting goods manufacturer. It was won by the electric railway team. The presentation was made at one of the monthly shows of the Railroad Club, where the banner was handed over to the victors by general manager Charles N. Black. The railroad men's band, which consists of 40 pieces, has frequently furnished music at the ball games, besides giving concerts on other occasions.

COASTING REGISTERS AND CURRENT CLOCKS

An account was published in the *ELECTRIC RAILWAY JOURNAL* of Oct. 30, 1909, of the working of a coasting register, invented by Frank Hedley, vice-president and general manager, and J. S. Doyle, superintendent of car equipment, of the Interborough Rapid Transit Company, and then being tested on the Second Avenue elevated line in New York. In the issue of July 9 an article by H. S. Putnam gave the results secured by the use of this register. The Railway Improvement Company, 165 Broadway, New York, has recently been organized, with Frank Hedley as president, and A. J. Pizzini as vice-president



Interior of Coasting Register

and general manager, to place this register on the market. Several important and large electric roads have already ordered the machines because of the large saving in the consumption of electric power.

Briefly, the object of the register is to obtain a comparative



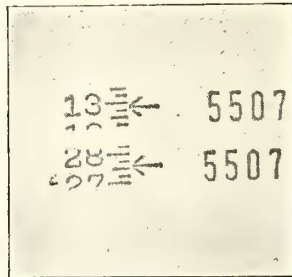
Coasting Register in Position

record of the efficiency of motormen in operating cars or trains. It was found during the trials on the Manhattan Elevated Railway with these registers and also with wattmeters that the differences in kw-hours used by different motormen, on the same line and running the same train, varied from a few per cent to as high as 30 per cent. The high figures were caused by carelessness in manipulating the controller and brakes, especially in not coasting as far as possible. Further investigation showed that a record of the time spent in coasting possesses certain advantages over the record of time spent in accelerating,

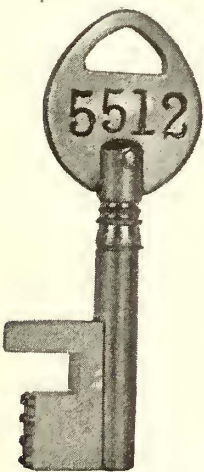
partly because it concentrates the attention of the motorman upon the importance of increasing the period during which the train is in motion without taking power from the line, and partly because it measures both the efficiency of accelerating and the efficiency of braking.

The accompanying illustrations show the construction of the device. The time mechanism, which is manufactured by the International Time Recording Company, consists of a double-spring, marine-movement time clock of special design, constructed to withstand excessive vibration and climatic changes, and with a capacity for running six weeks without rewinding. Attached to the escapement wheel of this clock is a braking device, automatically controlled by an electric magnet so arranged that the escapement wheel operates only when the car is coasting. From the diagrams on this page it will be seen that the magnet controlling the stopping and starting of the clock movement is interlocked with the master controller and the brake mechanism; consequently the clock will start only after the power has been turned on and then turned off, and it will stop as soon as the air brakes are operated. To start the clock again after applying the brakes, the motorman must again apply the current and cut it off with the brake in the off position.

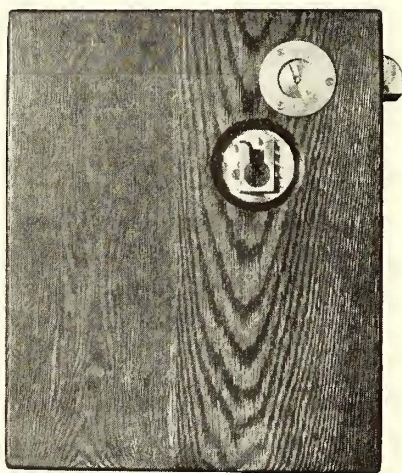
Each motorman is furnished with a numbered key, and on starting on his run he inserts this key in the register and then turns the key around. This records his numeral on the paper ribbon within the register. The motorman then operates his car or train in the usual way. During each interval of coasting his clock operates, but the ribbon remains stationary. At the conclusion of his trip the motorman again inserts the registering key in the device and turns it. This stamps the paper ribbon with the final reading of the clock. A facsimile of the record made is given above. It shows that the motorman, 5507, during his total run coasted from 13 minutes to 28 minutes, or



Record



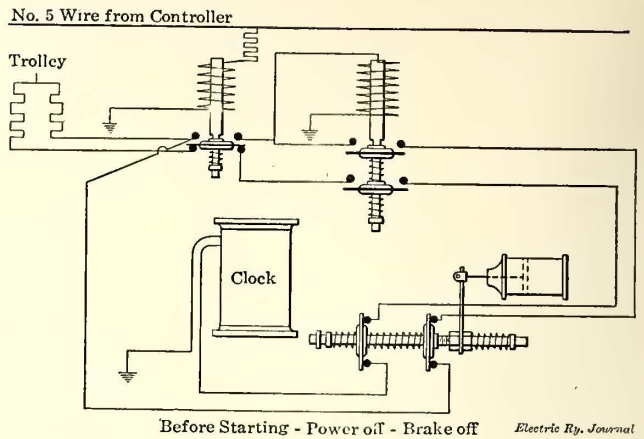
Recording Key



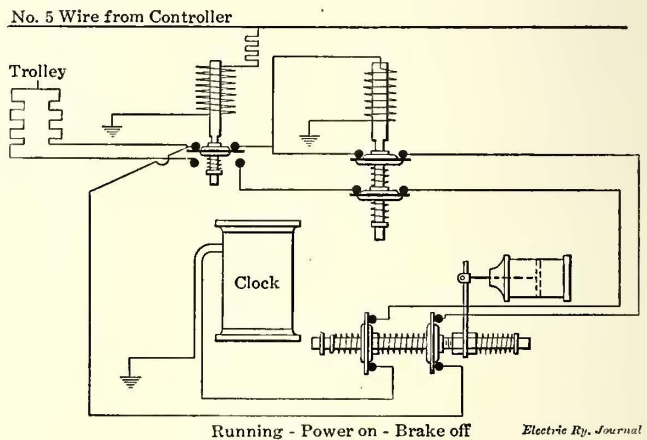
Exterior of Register

that the total coasting time for that particular trip was 15 minutes. The paper ribbon strips are turned in by each motorman at the end of each trip or day's work. They are added to give the total coasting time of each man and from them the superintendent can see who are the efficient operators and who the inefficient operators.

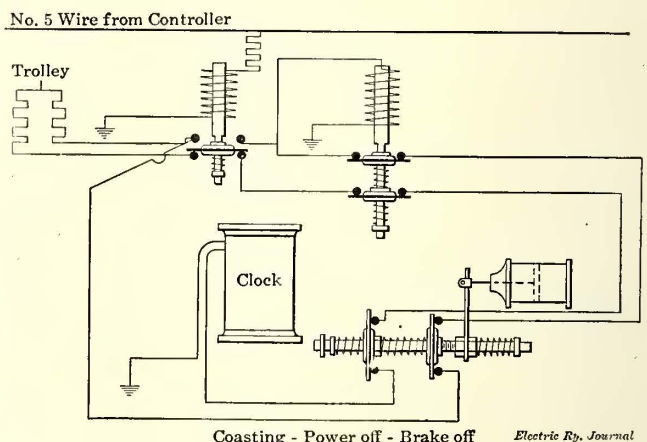
In addition to this register, the Railway Improvement Company is selling instruments, made in Germany, for measuring the time spent in accelerating. This device is a clock supplied with two magnets which are connected by a shunt coil from the controller and so arranged that when the current is applied



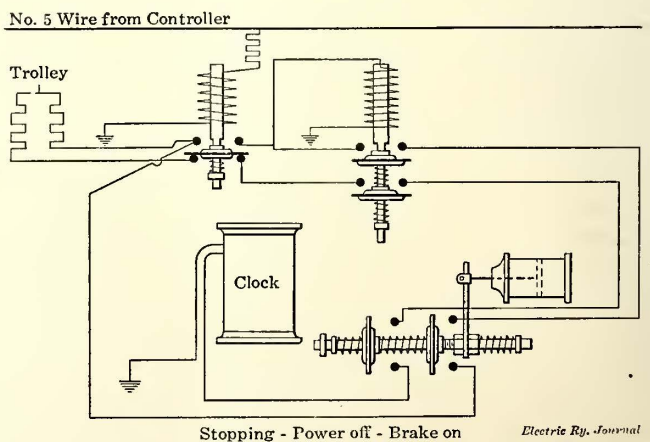
Electric Ry. Journal



Electric Ry. Journal



Electric Ry. Journal



Electric Ry. Journal

Wiring Diagrams, Showing the Connections of the Coasting Clock for Different Conditions

the magnets will lift a braking device on the balance wheel of the clock. The clock then starts running and continues until the controller is shut off, when the brake on the balance wheel is again applied. The clock requires winding only once a month, and has been adopted extensively in Germany and other European countries for obtaining comparative records of the time used in accelerating for different runs.

TRANSFER RULE BOOK IN UTICA

The operating department of the Utica & Mohawk Valley Railway has recently compiled and had printed in pamphlet form for the use of its conductors a hand-book of transfer rules and regulations. The object of the book is to give in one place and in clear language all of the information needed by conductors in issuing and accepting transfers. The first page is devoted to "transfer information." The second and third pages give the rules in regard to issuing transfers and the fourth in regard to accepting them. Then follow 19 pages showing in tabular form the transfer points on the system and the lines to which each line issues and receives transfers at these transfer points. As a book of this kind is quite novel in railway work, the matter on the four introductory pages is reproduced herewith with a page showing the method of tabulating the information in regard to transfer points. A sample transfer is also reproduced.

As already explained in this journal, the company uses different colors for a. m. and p. m. transfers, the a. m. transfer being printed on red paper and the p. m. on blue paper. The date of the month is printed on each transfer, but the name of the month itself is punched.

The company keeps a record of the transfers issued and returned by the different conductors and also compiles a daily report of the total number issued to passengers and collected

Transfers are printed in two colors, red for a. m. and lavender for p. m., and also show a. m. and p. m. on the face of the transfer. The names of the different months are printed on the top edge of the transfer and will be cut out by the Dispatcher before they are issued to the conductor. The day of the month is printed on the face of the transfer in large type.

The transfer carries no conductor's number. The serial number is printed on each transfer and they will be charged to the conductor by this number.

The line "to" and the time table, which shows the time of day, are shown on the face of transfer and are the parts of the transfer which require punch marks.

The transfer points are also shown in small type, on the face of the line to be transferred to, are shown on the back in such a manner that the same punch mark which cancels the line "to" will cancel the proper transfer point.

The transfer points are also shown in small type, on the face of the transfer, for the guidance of the conductor.

The "Common Center" is the space between Blandina and Genesee Sts. and Bagg's Square for north and southbound cars, and between Mohawk and Bleeker Sts. and West Ave. and Whitesboro St. for east and westbound cars.

A transfer to a north or southbound car will be accepted at any point between Blandina and Genesee Sts. and Bagg's Square, if the transfer point cancelled on the back is within the Common Center.

A transfer to an east or westbound car will be accepted at any point between Mohawk and Bleeker Sts. and West Ave. and Whitesboro Sts., if the transfer point cancelled on the back is within the Common Center.

All transfer points outside of the "Common Center" will be positive points, and transfers punched to show these points will not be accepted at any other point, except that Eagle and Elm and Oneida Square will be considered as one point and transfers will be accepted at either point, or between these points.

The conductor issuing transfer will punch it to show the time it will expire by adding a half hour to the time you will arrive at the transfer point.

TRANSFER RULES

HAVE ENOUGH TRANSFERS

Before starting your day's work be sure you have a sufficient quantity of both a. m. and p. m. transfers with the "month" properly cut out.

RIGHT DAY OF MONTH

Be sure that your transfers show the right "day of month."

RECORD OPENING NUMBER

Be sure to place the opening number (which is the number of the first transfer on pad) in proper space on your trip card at the beginning of each half trip.

NOTE.—If you use both a. m. and p. m. transfer during a half trip, place both opening numbers in proper place.

ISSUING

TIME TO ISSUE

Issue transfer at time of payment of fare

WHERE NOT TO ISSUE

Do not issue transfers to a line after having passed the transfer point (which is the first point of intersection with the line to be trans-

JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	1	15	30	45																				
UTICA & MOHAWK VALLEY RY. CO.												2	15	30	45																				
28th DAY		P. M. TRANSFER		SUBJECT TO		00607		RULES ON BACK		3		15	30	45																					
NOT GOOD AFTER		TIME PUNCHED		4		15	30	45	5		15	30	45																						
ROME & LITTLE FALLS												6	15	30	45																				
State & Columbia		West Av. & Whitesboro		Yorkville		Walkers		Rome Loop		Genesee and Columbia or Genesee and Bleeker		Mohawk & Bleeker		7	15	30	45																		
BLANDINA		MOHAWK		N. Y. MILLS		SUMMIT PARK		ROME CITY LINES		N. Y. C. DEPOT		ONEIDA R.W.		LINDOEN AVE		SOUTH		ELM		EAGLE		S. ON GENESSEE		CLINTON CAR		CAPRON		WEST AVE		MOHAWK		8	15	30	45
LINDOEN		WEST AVE		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		9	15	30	45
LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		10	15	30	45
LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		11	15	30	45
LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		LINDOEN		12	15	30	45

ROME AND LITTLE FALLS LINE	
ROME CAR	
TRANSFER POINT	
Mohawk and Bleeker or Common Center	RECEIVE FROM Mohawk St. ISSUE TO Mohawk St. and West Ave.
Genesee and Bleeker or Common Center	RECEIVE FROM Capron, Clinton, New Hartford, Cemetery, Eagle, Elm, South, Blandina, Oneida Ry. ISSUE TO Capron, Clinton, South on Genesee, Eagle, Elm, South, Lincoln Ave., Oneida Ry., N. Y. C. Depot.
State and Lafayette or Common Center	RECEIVE FROM Lincoln Ave.
West Ave and Whitesboro or Common Center	RECEIVE FROM West Ave.
Yorkville	RECEIVE FROM New York Mills.
Walkers	RECEIVE FROM Summit Park.
Rome Loop	ISSUE TO Rome City Lines.

TRANSFER TICKET—NOT TRANSFERABLE.

Good only for a continuous trip on line punched, provided the passenger changes cars at transfer point and presents it before time cancelled. Issued subject to the rules of this company. Its transfer or intentional use after proper time is a misdemeanor. Passengers must see that transfers are correctly punched before accepting same.

(R & L F)
 Sec-Eman Transfers, Rochester, [N. Y.] Printing Co., Mfrs.

UTICA & MOHAWK VALLEY RAILWAY COMPANY.

TRANSFER POINT	MOHAWK AND BLEEKER	GENESEE AND COLUMBIA OR GENESEE AND BLEEKER	ROME LOOP	WALKERS	YORKVILLE	WEST AVE AND WHITESBORO	STATE AND COLUMBIA
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Part applied for.

Front and Back of Utica Transfer Ticket and Page from Transfer Rule Book

from them on different routes. The conductors are also supplied with blanks of the kind illustrated on page 938 of the ELECTRIC RAILWAY JOURNAL for May 28, 1910, which explain to passengers that the conductors are not authorized to change the rules of the company relating to transfers. They are also provided with a package of blanks illustrated in the same issue upon which reports are made to the company of all cases where wrong transfers have been presented for payment of fare.

TRANSFER INFORMATION

A transfer is a ticket for the continuation of a ride and is not a stop-over ticket nor a return trip ticket and should not be used nor accepted as such.

A transfer is good for a ride only in the direction to which it is punched, viz.: a transfer punched to South on Genesee is good on any car going south over Genesee St., or one punched to West on Lafayette is good on any car going West over Lafayette, etc.

ferred to), except in the Common Center, and time then from the first point of intersection.

Transfers must never be issued to passengers if the car to which they wish to transfer passes the point where they boarded your car.

NO TRANSFERS ON A TRANSFER

Do not issue transfer on a transfer except where a Deerfield car or the Mohawk Street transfer car is involved, or upon an emergency transfer.

SHOW LINE "TO" AND TIME OF DAY

In issuing transfers be sure that they are correctly punched to show the line "to" and time of day (which are the only two punch marks required).

NOTE.—On special occasions conductors will also punch "month."

REISSUE IF DELAYED

In case of serious delay, blockage or derailment, the issuing conductor will take up transfers he has issued and issue properly punched ones.

TIME TO PUNCH

In punching the "time of day" add a half hour to the time you will arrive at the transfer point.

If you will arrive at transfer point between 8 minutes before and 7

minutes after the hour punch 30 minutes; between 7 minutes and 22 minutes after the hour punch 45 minutes; between 22 minutes and 37 minutes after the hour punch the hour; between 37 minutes and 52 minutes after the hour punch 15 minutes after the next hour.

If you arrive at exactly 7, 22, 37 or 52 minutes after the hour, give the passenger the extra 8 minutes.

CHANGE A. M. TO P. M.

Beginning at 11:22 a. m. use your p. m. transfers.

RECEIVING

LOOK AT TRANSFERS

In receiving transfers, look at color to see if it is an a. m. or p. m. transfer, look at "day of month" to see if it is the right day, look at line "from" to see if it is from your own line (if it is do not accept it unless it is an emergency transfer), look at line "to" to see if passenger is going in right direction, and look at time of day to see if time has expired. *Do not accept it after time cancelled nor in wrong direction.* An a. m. transfer, with the proper date and time, if presented before 5:00 o'clock p. m., will be treated as defective.

WHERE TO ACCEPT

Do not accept transfers at any place but transfer point cancelled on back of transfer unless transfer point cancelled is within Common Center.

DEAD TRANSFERS

In case a transfer is presented for transportation at any place other than the proper transfer point, or one is presented for transportation in a direction other than that indicated on the transfer, or one upon which the time has expired, explain to the passenger, *in a polite manner*, that under the rules of the company you are not allowed to accept the same, and request the passenger to pay fare. If the passenger does not pay fare, eject in the manner prescribed by the rules, making full report in writing on the blank furnished for that purpose.

DEFECTIVE TRANSFERS

A defective transfer is one upon which any of the required punch marks are lacking, or one punched ahead of time. In case a defective transfer is offered for transportation *do not* eject passenger, but lift transfer and turn it in to Dispatcher in separate envelope with full report.

MISTAKE IN PUNCHING

In no case will a conductor destroy any transfer. If you make a mistake in punching a transfer for a passenger, issue a new transfer, take up the one you made the mistake on and turn it in with your unused transfers.

LONG HEADWAY CARS

Conductors on cars which are running at one-half hour, or longer, intervals, will accept transfers punched to their line on the next connecting car after time punched if passenger has not had an opportunity of getting a car on line punched.

CALL TRANSFER POINTS

Conductors **MUST** call all transfer points, and every line which can be transferred to at each point.

In announcing transfer points, speak loudly and distinctly enough so that passengers in every part of the car can hear and understand every word said.

IN CASE OF DELAY

In case of serious delay, blockade or derailment, conductor will accept transfers upon which the time limit has expired until they know, or are informed by Inspector or Dispatcher that the schedule has been resumed.

REVENUE FROM THROUGH TICKETS IN ENGLAND

References were made in the issues of the *ELECTRIC RAILWAY JOURNAL* for May 7, 1910, page 824, and July 23, 1910, page 154, to the establishment of through tickets between the London County Council Tramways and the Croydon Corporation Tramways. The arrangement became effective as of July 31, 1909, and through the courtesy of T. B. Goodyer, tramways manager, of Croydon, figures are available showing the results of operation for the first year. The number of through tickets issued by the London Tramways was 508,504, as compared with 569,548 by the Croydon Tramways, a total of 1,078,052, or an excess of 61,044 by the Croydon system. Values of the through tickets issued by the London Tramways reached £6,025, as compared with £7,111 for the Croydon system, or an excess of £1,086 for the latter. Revenues from this business were apportioned, under the agreement, "in accordance with the fare stages traversed in the area of each authority," as follows: To London County Council, £8,948; to Croydon corporation, £4,188; total, £13,136.

SPECIAL RATES FOR THE ATLANTIC CITY CONVENTION

H. C. Donecker, secretary of the American Street & Interurban Railway Association, has announced that a special rate of one and one-half fare for the round trip to Atlantic City, N. J., and return, at the time of the convention next month, has been granted from all points in the territory of the Trunk Line Association, the Central Passenger Association and the New England Passenger Association. The Southeastern Passenger Association has also granted special rates and has issued a supplementary tariff covering the rates which will be in effect at the time of the convention. The Southwestern Passenger Association, in line with its established policy, has refused to grant special rates from points in its territory, but the special rates of the Central Passenger Association will apply from St. Louis. The Western Passenger Association has made no special rates, but the usual transcontinental excursion rates can be obtained from all western points.

COMMUNICATION

VENTILATOR ORDINANCE IN DETROIT

DETROIT UNITED RAILWAY

TO THE EDITORS:

Detroit, Mich., Sept. 1, 1910.

The courts have recently declared invalid the ventilator ordinance passed by the Common Council of this city and that body proposes to pass another ordinance that will permit the use of any ventilating device of proved merit, thus enabling us to go into the general market for such a device. We are willing that manufacturers should install their device on one or more of our cars, with the understanding that the same shall be tested by the Department of Public Health. When we have thus ascertained what ventilators are satisfactory we shall equip our cars.

Will you kindly notice this in an early edition of your paper in order that manufacturers may take the matter up with us if they so desire.

F. W. BROOKS, General Manager.

TEMPORARY INJUNCTION GRANTED IN COLUMBUS

The Columbus Railway & Light Company applied, on Sept. 3, to E. B. Dillon, judge of the common pleas court at Columbus, for a temporary order restraining the striking trainmen in some measure from active interference with operations. Judge Dillon granted an order, which is directed against the local union, its officers and many individual members. The order was made effective from Sept. 3 to 10, covering the week of the state fair. Upon application of F. S. Monnett, the defendants were granted until Sept. 8 in order to present law and evidence. The case is assigned for hearing on Sept. 10.

The temporary restraining order forbids the strikers or any one acting for them to circulate printed matter warning people not to ride on the car or that it is dangerous to do so; to aid or abet any person in circulating such matter; to patrol or picket the various steam railroad and interurban stations and State Fair grounds and vicinity; to make threats against persons at these places, or to attempt picketing or the persuasion of people at the stations or fair grounds. Peaceful persuasion or picketing at other points is not prohibited. The company is restrained from keeping men at the stations to advertise its service.

In addition to the points on which an injunction was secured the company asked for an injunction against interference with the conduct of its property, against the employment of pickets of the streets, against the insult or intimidation of passengers, against the use of missiles or the placing of explosives on car tracks and against the aid of mob violence. Judge Dillon, however, did not enjoin activity in these matters. He said: "The defendants have a right to be heard and their rights to be adjudged. In the meantime I have granted such an order as will protect people who visit the State Fair."

The petition for injunction filed by the company charges conspiracy. It says that to have granted the union demands would have been to turn over the company's business to the union, whose men are declared to be unfit and incapable of conducting the company's business.

The company says that about 330 conductors and motormen are on strike, about half its regular force. It gives instances of mob violence in which cars were stoned, shot at and dynamited. Exhibits of warning cards and "unfair" lists are given.

The company charges that agents of the union have gone over the state declaring the city unsafe and stating that it was dangerous to visit the State Fair, all for the purpose of injuring the company's business.

The petition says that part of the company's men went out on strike on July 24 "and by malicious design to injure and annoy said plaintiff and cripple it in its business, and to incommode the public, said strikers in a very large measure stopped the operation of said street railway and have ever since and continu-

ously impeded and interfered with the traffic thereon, thereby reducing the revenue arising from said traffic and greatly incommoding the public, which otherwise would have patronized said railway."

Would-be employees have been threatened with bodily harm and intimidated, even in their homes. Cars have been stoned, made targets for bottles and acid and missiles have been thrown at passengers, causing great fear and death and injury.

The company complains of circulars scattered broadcast which read: "Attention! The strike is not over," and "Warning! Conditions are worse than reported by newspapers. There will be great danger in riding cars during fair week."

A reference to the police department is as follows:

"Owing to the friendly and partial attitude of the police department toward the defendants, the plaintiff has received slight protection at its hands and in many instances some of the patrolmen have violated their duty to the public by refusing and neglecting to put down said disturbances, or to protect the property of said plaintiff, but on the contrary have on numerous occasions joined with said strikers and their confederates in assaults and intimidations upon those operating the cars of said plaintiff and others guarding its property, and have made arrests of the crews operating the cars of said plaintiff in order to pull them from said cars and thereby interrupt plaintiff's business and turn over the crews to the mobs incited by said defendants and their confederates and in some instances have permitted passengers of said cars to suffer violence at the hands of the mob."

The petition adds that "owing to the fact that this plaintiff has received but slight protection and in most instances no protection from the police force of the city of Columbus," the company has been compelled to keep private guards on hand at great expense to protect its own property and the traveling public "from the depredations brought about and incited by said defendants and those acting with them."

T. J. Keating, attorney for the company, in an interview in the *Ohio State Journal* for Sept. 4 is quoted as follows: "This suit is the forerunner of other suits, in which the union and the union men will be made defendants for all damage done during the strike. All those whose names are included in the 'unfair' list have rights of action against the strikers and they may recover if the men have anything upon which courts may levy."

The evening of Aug. 30 was made memorable in the history of the Columbus strike by the partial destruction of three cars and the injury of seven persons by dynamite explosions. The most deadly explosion of the three was at the corner of Main and Seventh streets, where almost the entire floor of a car was blown out and the wheels were shattered.

Another car at Long Street and Monroe Avenue was blown from the tracks and the equipment crippled. It is said that the explosion in this case occurred near the rear truck, indicating that the dynamite had been thrown under the car.

The third car was wrecked by an explosion under the forward trucks at a Sandusky Street crossing. Two women passengers were injured and the car was badly damaged, but the crew escaped. This trouble was preceded on the evening of Aug. 29 by the destruction of a car on Leonard Avenue in the same way. The first mob demonstration which has taken place for some days occurred at this point, but the rioters were driven from the street by policemen and a detachment from Battery C, which had supposedly been relieved from duty some days previously. When the rioters discovered that they had to contend with the state troops they fled. Riot clubs were used by both the policemen and the soldiers and several arrests were made.

General Manager E. K. Stewart met a committee of labor leaders of the State on Aug. 30, when he was asked to submit the matter to arbitration. Mr. Stewart replied that the only difference between the men and the company is the question of recognizing the union and that that question could not be arbitrated. He made it plain that the company stands on this proposition just where it did in the beginning and that the men will be taken back in their individual capacity only.

This committee later held a conference with Governor Har-

mon and asked that he take steps to force the company to arbitrate. On Sept. 3 Governor Harmon stated that he could not accede to the wishes of the union men, as this would be practically taking sides, something that he has avoided all along. This was followed by a request from the Governor to the Attorney-General that he conduct a special investigation with a view to apprehending those persons who have been guilty of dynamiting and stoning cars or taking part in riots in other ways. The Governor then issued a statement to the public asking that people attend the State Fair and assuring them that there will be no danger in doing so. He ordered six more companies of the State troops to be on duty in Columbus during the week and the cars on lines reaching the State Fair grounds will be protected.

Labor organizations in several cities have adopted resolutions declaring that Governor Harmon has allied himself with the railway company by refusing to use his office to force arbitration.

The Chamber of Commerce has offered rewards as follows: \$250 for the conviction of persons guilty of stone throwing; \$500 for the arrest of persons for shooting at cars, and \$1,000 for the apprehension of persons who dynamite cars. The company has also offered rewards for the arrest of persons guilty of these crimes.

Both the police department and Sheriff Sartain have been searching for several days for Albert Strader, who is accused of placing the dynamite which wrecked the three cars on the evening of Aug. 30. Since that evening the city has been comparatively free from trouble.

The cars are liberally patronized through the day and some business is done in the evening. It is believed that the rapidly increasing patronage induced the resort to dynamite.

A sympathetic strike in other industries has been threatened, but doubts are expressed as to whether this would be successful.

COUPLERS DISCUSSED BY THE STANDARDIZATION COMMITTEE OF THE CENTRAL ELECTRIC RAILWAY ASSOCIATION.

The standardization committee of the Central Electric Railway Association met at Fort Wayne, Ind., on Sept. 1, and considered recommendations for standardizing couplers and other car details which it will present at the meeting of the association to be held in Indianapolis, Ind., on Sept. 22. The following members of the committee were present: H. H. Buckman (chairman), master mechanic Indianapolis & Louisville Traction Company; L. D. Jacques, master mechanic, Fort Wayne & Wabash Valley Traction Company; R. N. Hemming, assistant superintendent Ohio & Southern Traction Company, and W. P. Graydon, master mechanic, Western Ohio Railway. The coupler manufacturers were represented by Messrs. W. T. Van Dorn and C. H. Tomlinson. Morning and afternoon sessions were held and at noon the committeemen were the guests of the Fort. Wayne & Wabash Valley Traction Company at luncheon.

The chairman announced that a copy of the Car Builders' Dictionary had been purchased and was now available for reference at the office of the association at Indianapolis. Mr. Hemming read the minutes of the last meeting of the committee, the substance of which appeared on page 30 of this paper for Aug. 27.

DRAWBAR ANCHORAGE

Mr. Buckman first directed the attention of the committee to the need for recommendations as to controlling dimensions for that part of the drawbar anchorage to which the coupler tail piece is attached. Each road would have to supply detail drawings for the rest of the anchorage but the parts into which the tail piece fitted should be standardized so that new couplers could readily be inserted in place of those damaged while cars were on foreign roads. An important point in designing the anchorage was to keep the line of pull as straight as possible and the swivel connection as close as possible to the sills. Also

it was necessary to limit the depth of the anchorage so that it would not interfere with large motor frames which project above the top of the trucks.

After consideration of the severe demands imposed on the anchorages of interurban couplers, some of which must regularly withstand the strains of pushing 62-ft. cars with 37-ft. truck centers around 35-ft. radius curves, the committee decided to recommend the following controlling dimensions for a standard anchorage which would accommodate all standard coupler tail pieces:

(1) Depth of anchorage casting below sill to be 12 in., maximum.

(2) Distance from bottom of sill to center of coupler tail piece at swivel pin anchorage maximum 6 in.; minimum 5 in.

(3) Vertical opening in anchorage for tail piece, 4 in.

(4) Depth from center of swivel pin to back end of opening in jaw in anchor casting, 5 in.

It was decided to recommend that the "Tail piece of coupler must be interchangeable and inter-operative with drawbar anchorage." To provide for this interchangeability the following dimensions were suggested for a standard drawbar tail piece:

(1) Diameter of straight swivel pin 2 in.

(2) Distance from center of swivel pin of tail piece to back end of tail piece, 4½ in.

(3) Vertical thickness of tail piece, 3½ in.

(4) Diameter of hole through tail piece, 2 1/16 in. for vertical height of 1½ in. and tapered to 2 5/16 in. diameter at ends of hole.

(5) Diameter of bosses on anchorage casting and on tail piece, 4 in.

(6) Bosses to be ¼-in. thick.

The location of the coupler with reference to the buffer face was next discussed and the committee agreed to recommend that the "Pulling face of the coupler should project 6 in. beyond the face of buffer at the maximum swing of the drawbar." This distance was agreed upon to provide for the close intercoupling of cars with and without radial buffers and to make possible the use of high coupler knuckles and gravity knuckle locks.

It was suggested that the manufacturers of couplers should confer regarding the selection of some type of radial coupler interlocking device that would provide for universal intercoupling of different designs of radial couplers such as are now used on interurban cars and also permit intercoupling of these with steam road couplers.

After a lengthy discussion on the proper length for drawbars the committee decided to recommend that the length from the center of the swivel pin to the pulling face of the coupler should be 4 ft. 8 in. This was a compromise between the 4 ft. 6 in. and 5 ft., two dimensions now commonly used. If drawbar carriers are used the opening for the coupler stem should be 6½ in. wide and 8½ in. high, thus providing for 1¼ in. horizontal play and 2¾ in. vertical play before the carrier would need to move.

President Shaw, of the American Street and Interurban Railway Association, has addressed a letter to the presidents and general managers of the railway companies urging attendance at the next convention. He states that the programs of the various associations have now been practically completed, and that the meetings will undoubtedly exceed in interest those of previous years. To insure this result, however, will require a representative attendance from member companies, and the president asks each company to see that as many representatives attend the convention as possible.

As an aid in securing the best results from the meeting, the letter suggests that each company have a staff meeting of the heads of departments, prior to the convention, to discuss there the problems which will have to be met during the coming year, and to go to the convention prepared to seek and find the answers to these problems.

DECISION OF WISCONSIN COMMISSION CONSIDERS THE RATE OF RETURN

In reaching a decision in the case of Frank B. L. Fullmer versus the Wausau Street Railroad Company the Railroad Commission of Wisconsin valued the property, analyzed the earnings, re-distributed some of the charges for expenditures and applied allowances for depreciation with the object of determining the net rate of return secured. A summary of the conclusions reached by the commission follows:

"The testimony on the re-hearing and the investigations of the commission following the same revealed a situation with respect to respondent's business somewhat different from that which was assumed in the first proceeding. Material changes have taken place in the business. The railway system has been extended. An unusual advance in traffic and revenues has resulted, and the annual rate of profits has greatly increased.

"The rate of profits shown by respondent's reports was higher than the rate found by the commission, on account of the respondent company's former practice of charging numerous items of operation and maintenance to the construction account. This practice has apparently ceased, and the company seems to be endeavoring to comply with the uniform accounts required by statute.

"A new and simpler schedule of rates has been proposed by respondent and put into effect March 10, 1910. This schedule is approved, subject to such changes as may be made hereafter in accordance with law. The order re-affirms the original order with respect to combination or joint tickets, with respect to separate accounts showing the operation of the park and also separate accounts for each class of passenger fares."

These conclusions were reached by the commission after a re-hearing on petition of the company alleging numerous grounds of error in a previous decision of the commission, dated May 22, 1909.

In the decision, of which an abstract is published herewith, the commission calls attention to an erroneous assumption to the effect that the previous order fixed 6 per cent annually as the maximum permissible rate of return on investments in such properties. The commission has not proclaimed such a doctrine. If the commission erred in its previous order with respect to the rate of return it did so, the decision says, solely because the company represented its business in a more favorable light than the facts warranted.

Reviewing the testimony on the subject of a fair rate of return and allowance for depreciation the decision says:

"Respondent's officers and others urged that the assumed intimation by the commission, that 6 or 7 per cent might, in certain cases, be sufficient, had already discouraged capital to some extent. This assumption has already been disposed of. It was further pointed out that the regular rate of interest on ordinary security loans, in the community in which respondent is operating, is from 6 to 7 per cent; that the profits in ordinary commercial ventures range from 10 to 40 per cent; that in some cases, notably in real estate transactions, profits run up into hundreds of per cents; and that Wisconsin River valley banks pay from 10 to 15 per cent on their stock. For these reasons it was urged that a public service corporation, entering upon a more or less hazardous venture, in order that it may be able to secure the necessary capital, must be able to hold out to investors a more liberal rate of return than 6 or 7 per cent. The president of the respondent company believed that the company ought to be allowed at least 10 per cent, particularly in view of the fact that all the services and work necessary in promoting the company and managing the same at the time of its inception were donated; and further in view of the fact that at the present time the officers of the company are not receiving adequate compensation.

"Testimony was also given as to a proper allowance for depreciation and contingencies. One witness, an expert in constructing and operating street railroad systems in this section of the country, testified that from 5 to 8 per cent of the value of the plant should be set aside for depreciation,

and 5 per cent of the gross earnings should be set aside for contingencies."

The decision also reviews the testimony as to the operation of parks by street railways, as follows:

"Concerning the general question of parks and amusement resorts operated by street railroad companies, officers of the company practically admitted that, as a general thing, it is not the best policy for street railroad companies to engage in amusement resort ventures on a commercial basis, especially in competition with private enterprises of a similar character. In the present case, however, it was pointed out, the park was improved and maintained, and the line extended to that point only in answer to an overwhelming public demand. Without such created traffic, it was claimed, the line could not be made to pay.

"In support of the claim that the operation of a small system is unprofitable without created traffic, the experience of another Wisconsin city is cited, in which it was found that the system was unprofitable until an amusement resort was established, when the gross revenues increased 15 per cent the first year, 12 per cent the second, and 8 per cent the third."

The commission concludes that the total reduction of fare involved in its previous order would probably not exceed \$4,000, or about two-fifths of the reduction claimed by the company.

Based on valuations made by the engineer of the commission, the value of the transportation department plant of the company as of June 30, 1908, was \$144,643. After deduction of the value of non-depreciable property—land at \$3,904 and stores and supplies at \$123—and of 12 per cent allowed for engineering and contingencies, \$14,505, the value of the depreciable property is \$126,111. Classification of the items of property into twelve different groups, according to the life of the different classes and deduction of the estimated scrap value from the cost new is followed by an estimate of the amount of annual reserve which must be set aside to meet the depreciation of the plant. The amount as calculated on the value of the depreciable property is equal to an annual rate of 5.34 per cent. Based on the composite lives of numerous electric plants in the State it is found that a rate of 5.75 per cent on the value of the depreciable property will supply an adequate depreciation reserve for the light and power department. Water powers also comprise part of the property of the company, but the commission concludes that the information before it is insufficient for the establishment of closely accurate valuations of water powers.

With some allowances for that part of the plant which was installed new and estimating the value of the water powers at \$100,000 the commission computes the light and power department at, say, \$100,000, and the transportation department at \$130,000, a total of \$330,000 as of July 1, 1908. Subsequent additions increased the investment, according to the figures of the commission, to \$436,774 as of Jan. 1, 1910.

A comparative table, showing the earnings as compiled by the commission for the 12 months ended June 30, 1909, and by the company for the 15 months ended on that date, is published. While the revenues are in substantial agreement important differences are found in the expenses. The decision says that the fact that the expenses, as ascertained by the commission, do not run as low as those reported by the company, "is due to the practice of the respondent to charge to its construction account items representing maintenance or repair expenses." Such items were redistributed by the commission. In compilation of the income account interest on the funded debt and dividends were distributed on the basis of 60 per cent to lighting and 40 per cent to the transportation department, according to the relative plant values. Interest on the floating debt, which appeared to be chargeable mostly against the light and power department, was distributed on the basis of 80 per cent and 20 per cent, respectively, a ratio which coincides with the current consumed by the respective departments. The surplus reported by the company for its entire operation would appear to be about \$27,000, while the commission found a surplus of only \$20,000.

In a similar compilation of figures for the calendar year 1909 expenses were found to be higher than for the fiscal year, but revenues were considerably higher. Interest on the funded debt, taxes and dividends was apportioned on the basis of 2/3 to lighting and 1/3 to transportation. Interest on the floating debt was apportioned on the same basis as for the fiscal year. The final surplus was shown to be over \$32,000. By application of the depreciation figures shown in the foregoing and accepting the expenses and earnings as determined by the commission, the net rate of return is computed in the decision as shown in the accompanying table.

NET RATE OF RETURN OF WAUSAU STREET RAILROAD COMPANY AS COMPILED BY RAILROAD COMMISSION OF WISCONSIN.

	Fiscal year, June 30, 1909			Calendar year, 1909		
	Light and power.	Transportation.	Total.	Light and power.	Transportation.	Total.
Revenues	\$53,444	\$39,348	\$92,792	\$59,582	\$48,622	\$108,204
Operating expenses.....	\$16,072	\$25,188	\$41,260	\$18,150	\$24,594	\$42,744
Taxes	965	1,337	2,302	1,812	902	2,714
Depreciation	5,464	6,731	12,194	8,682	7,445	16,127
	\$22,501	\$33,256	\$55,757	\$28,644	\$32,941	\$61,586
Net income.....	\$30,943	\$6,092	\$37,035	\$30,938	\$15,681	\$46,618
Net rate on return on average investment for year, per cent	13.4	4.3	9.96	11.9	10.2	11.3

Commenting on these figures the commission says that the expenses of the company as a whole were reduced somewhat by improper charges to construction so that the real net rate of return for the fiscal year was, in reality, not as high as is indicated, but that for the calendar year the net rate of return indicated is probably accurate, at least so far as the transportation department is concerned.

In its conclusion the commission says:

"With reference to the undue augmentation of the construction account, it should be pointed out that this practice has a tendency to cause the apparent total liabilities of a plant largely to exceed even a liberal valuation of all its physical properties. A careful appraisal of such physical properties is likely to establish the extent of the excess, if any excess exists. This situation generally does not develop into an acute stage until after a plant has reached some degree of maturity in years, and long after those who have encouraged such practices have disposed of their holdings. In the past it has been a matter of common financial history to have promoters of utility properties employ improper accounting methods in order to inspire confidence in and arouse enthusiasm for their securities. The experiences of the investing public resulting from such methods on the part of promoters, have doubtless caused much of the suspicion with which the securities of public utilities have sometimes been regarded, to the loss and inconvenience of properly conducted enterprises.

"However, we desire to state expressly, and with emphasis, that while the respondent company has followed incorrect accounting practices in the past, it is now making an honest effort to comply with the uniform accounts prescribed by the commission, in conformity with the requirements of the utilities law. The results of operation of the last six months show a remarkable increase in traffic and a corresponding increase in gross and net revenues, sufficient to yield a liberal return on the investment. Under these circumstances we think that this property of the respondent company is entitled to the confidence of the investing public."

In a paper presented on Sept. 9, before the Central Railway Club, Buffalo, N. Y., by E. M. Tewkesbury, general superintendent of the South Buffalo Railway, the writer stated that he was installing about 1 mile of test track in which 90-lb. rails made of Bessemer steel with an alloy of ferro-titanium are laid on oak ties, hook shoulder tie plates, Abbott joint plates and stone ballast. It is expected that the heavy traffic over the trial section will soon show the possibilities of ferro-titanium for decreasing rail wear.

POWER DEVELOPMENT FOR WORCESTER CONSOLIDATED SYSTEM

On account of the necessity of an additional power supply for car service the Worcester Consolidated Street Railway Company is preparing to build as an addition to its equipment a turbine plant which will have an initial rating of 5500 kw. The new apparatus will be installed in the Millbury power station of the Worcester & Blackstone Valley Street Railway Company, which, with the Worcester Consolidated system, is one of the properties under the control of the New England Investment & Security Company. Power will be transmitted to the heart of Worcester by two high-tension alternating-current circuits and distributed from a substation to the feeder lines supplying the cars within the city. The new service will supplement that of the existing generating station of the Worcester company at Fremont Street, in the southern part of the city.

Since the earliest days of electric railway service in Worcester the supply of power to the local lines has been on a direct-current basis. The electrical supply for car operation has largely been drawn from the power plant at Fremont Street, about 2 miles south of the center of distribution. The latter point is in the vicinity of the Worcester City Hall. The Fremont Street station began work as a belted plant about 20 years ago, and has from time to time been extended by the installation of generating equipment direct-driven by vertical cross-compound condensing engines. The boiler plant has been extended to meet the requirements of the engine installation, and a few years ago an elaborate system of coal storage and handling by an electrically operated bridge was placed in service. The station is located on the side of the Boston & Albany Railroad and has excellent facilities for the delivery of fuel. At present it has about reached the limit of its capacity, which is 6500 kw, and its location so far south of the center of distribution is unfavorable to the most economical service.

The Millbury station has been in service about seven years supplying power to the car service in the Blackstone Valley, and is a modern reciprocating-engine plant with direct-connected generators wound for direct-current delivery. The station is a brick and steel structure located on the south side of the town, about 6 miles south of Worcester, and it now contains two 300-kw generating sets, each consisting of a Westinghouse 550-volt dynamo direct connected to a horizontal compound condensing Hamilton-Corliss engine. The station equipment also contains a water wheel belted to a 500-kw generator, the water supply being drawn from a canal connected with the Blackstone River. The station building is about 106 ft. long x 102 ft. wide outside the walls, and it is divided into the conventional boiler and engine room, each room occupying practically half the ground area of the plant. The steam supply for the existing units is furnished by three 150-hp boilers of the horizontal return tubular type operating at 160 lb. steam pressure. The draft for the boilers is provided by a brick stack 145 ft. high and 6 ft. in diameter, and coal is supplied by a side track of the New York, New Haven & Hartford Railroad.

The turbine equipment will be installed in the engine room of the present Millbury station, and the existing boilers will be taken out and four 800-hp Edgemoor water-tube boilers installed. It is probable that the new boilers will be provided with temporary stacks, in order to enable service to be kept up from the present boilers while the new equipment is being installed. A coal pocket will be built in front and above the site of the new boilers, and mechanical methods of handling the fuel will be installed in the plant. Duplicate boiler feed pumps of a size to supply double the feed water demands of the installation will be placed in the station. The ashes will be dropped through hoppers below the boiler room floor level and removed by cars or wagons, according to the present plan.

The operating steam pressure of the turbine will be 200 lb., with 150 deg. superheat. Each boiler will be equipped with a Foster superheater. The turbine is to be of the Curtis horizontal type, with a normal speed of 1500 r.p.m., and it is to be of the two-stage design. Feed water for the boilers will be drawn from the present source, which is a stream about 1000 ft. away from the plant which discharges into the Blackstone River. Gravity delivery of the water to the feed pumps will be employed. The turbine will be provided with a General Electric 75-kw turbo-exciter, wound for 125 volts. This exciter will be sufficient to handle two turbines when necessary. When the plant is enlarged, if the present line of equipment is followed, a motor-driven exciter will be installed for continuous operation. The station has been equipped with a 20-ton hand-operated crane. An interesting feature of the plant will be the absence of any circulating pump in the condensing system. Circulating water will be drawn from the canal, which has a cross-section of about 16 ft. x 7 ft. and the head upon the condenser tubes will be about 11 ft. This canal leads to the plant from a dam belonging to the company about 1500 ft. from the plant. The present condensing equipment is of the jet type, one unit being installed for each engine. As the Blackstone River contains a considerable part of the sewage discharge from the purification works of the city of Worcester, the water is unsuited for boiler feeding, but satisfactory for condensation purposes.

If the station is extended it is planned to install all high-tension busbars, oil switches, lightning arresters, etc., in a fireproof building on the opposite side of the canal from the station, giving a clear distance of about 50 ft. between the switch house and the station proper. The operating switchboard in such event will be located inside the turbine room, and the high-tension apparatus will be provided with remote control mechanism. From the station two three-phase, 13,200-volt, 25-cycle transmission lines will be run to the Worcester substation. It has not yet been settled whether the line will be run underground, on steel towers, or on wooden poles. The size of wire used will probably be No. 0 copper. As there is no alternating-current apparatus in the Fremont Street station, and as the Millbury turbine addition is to supply the service in the city of Worcester, the alternating lines will be carried direct to the Worcester substation. The latter will be connected with the Fremont Street station by 12 direct-current feeder lines averaging 500,000 circ. mils individual area of cross-section. These lines are already up, and will connect the direct-current buses of the substation and the power house at Fremont Street.

The Worcester substation will be a fireproof structure, containing an initial installation of two 1500-kw General Electric rotary converters and six 550-kw air-cooled General Electric transformers. The rotaries will be started from the alternating-current side. The substation will contain the usual complement of switchboard equipment for 13,200-volt service, and the building will be large enough to contain an ultimate installation of five 1500-kw rotaries. The direct-current feeder switchboard of the substation will contain 24 panels. At present the average load upon the Fremont Street station is about 4500 kw, and the maximum load is about 8500 kw. About 300 cars are now operated on the city and immediate suburban lines at Worcester and are supplied by the existing plant. It is anticipated that the installation of the turbine at Millbury and the substation at Worcester will improve the voltage conditions very materially in the portions of the city which are at present remote from the Fremont Street plant, while in the neighborhood of the plant the conditions will be maintained well. The plan of operation now under consideration is to operate as much of the Worcester service as possible on the turbine at Millbury, taking the balance of the load on Fremont Street station. It is expected that this plan will result in an excellent load factor at Millbury, and the machinery of older type or relatively poor efficiency at Fremont Street will be operated only in emergencies.

STEAM TURBINES FOR HIGH AND LOW PRESSURE SERVICE

The De Laval Steam Turbine Company has adapted its high-pressure single-stage impulse turbine for both high and low-pressure service. In this turbine the complete expansion of the steam takes place in a single nozzle. Steam entering at full pressure expands in the nozzle to the final or condenser pressure, thus converting all the heat energy between the two temperature limits into energy of velocity. A nozzle for receiving high-pressure steam and exhausting into a condenser is shown in Fig. 1. Fig. 2 shows a nozzle for receiving exhaust steam and discharging into a condenser or for receiving live steam and discharging against atmospheric pressure, both cases involving about the same expansion ratio. It is possible, by utilizing the full periphery of the wheel, to place enough nozzles of various ratios of expansion to suit a variety of conditions. For in-

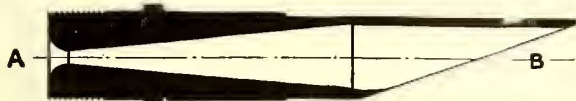


Fig. 1—High-Pressure Nozzle



Fig. 2—Exhaust Steam Nozzle

stance, one set of nozzles can be provided to receive high-pressure steam and exhaust to a condenser and one set to receive low-pressure steam and exhaust to a condenser.

It might appear that in a mixed-flow turbine of this type the efficiency would be sacrificed when operating on either high or low pressure, since the velocity of steam issuing from the nozzle would be different in the two cases while the velocity of the wheel must remain the same. It is asserted, however, that the proportion of the total work abstracted from the steam is not much different in the two cases. A wheel speed suitable for one ratio of expansion will serve fairly well for all other ratios encountered in high or low-pressure work, it being necessary only to modify the nozzles in order to obtain the best conditions. A machine of this design is shown in Fig. 3. This turbine which generates 150-hp for two 16-in. centrifugal pumps connected in service, was installed in a large steel mill to receive the exhaust from several hydraulic-pressure pumps and other auxiliary machines, all exhausting into a common header. Because of the feasibility of using live steam in a separate set of nozzles to supplement any deficiency in power from the exhaust steam, it

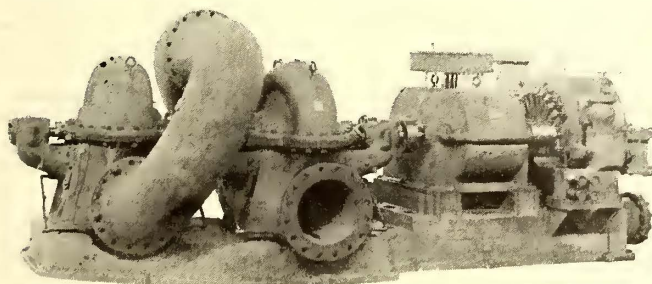


Fig. 3—A 150-hp Low-Pressure Turbine Direct-Connected to Two 16-in. Centrifugal Pumps

was not considered necessary or advisable to install a regenerator or other means for storing heat, nor was a reducing valve fitted to supply steam at low pressure from the boiler. The turbine exhausts into a large central condensing plant, in which the vacuum varies from 18 in. to 27 in., averaging about 22 in. There is also a possibility of losing this vacuum entirely at times, due to troubles with the engines or to air leaks, making it necessary to operate the turbine non-condensing. The requirements of the specifications, which were fully met under test, were as follows:

“To carry full load when using steam at atmospheric pressure exhausting into a vacuum of 22 in.; also to carry full load when receiving steam at 120 lb. and exhausting into a vacuum of 22 in.; also to operate condensing with steam at 90 lb. pressure, exhausting into a vacuum of 22 in. and in an emergency to

operate non-condensing with steam at 90 lb. pressure, all changes to be carried out automatically by the turbine itself, with the exception of the change to the non-condensing condition.”

The turbine has two governor valves and two governors, one for high-pressure steam and one for low-pressure steam, the high-pressure governor being set at a few revolutions below normal speed and above this speed the high-pressure valve is kept tightly closed. The low-pressure governor is set for normal speed, but on the failure of the low-pressure steam supply the machine will drop a few revolutions, less than 2 per cent, whereupon high-pressure steam is admitted to the high-pressure nozzles. At the same time the low-pressure nozzles continue to utilize any exhaust steam available, the pressure limits varying in practice from 2 lb. above atmosphere to 5 in. of vacuum. To provide against runaways, as in case the high-pressure valve should leak when the turbine was lightly loaded, an emergency stop is provided consisting of a butterfly

valve in the exhaust pipe controlled by a piston but normally held open by a spring. In case of excessive speed, air is admitted behind the piston, closing the butterfly valve. As soon as the speed is normal again, the governor closes the air valve and air leaks into the vacuum, the butterfly valve in the exhaust pipe again restoring normal conditions. Unlike the usual vacuum-breaking device, this method does not interrupt the condenser service.

Another machine made by this company was built for 1½ lb. steam pressure when exhausting into a 26-in. vacuum, under which conditions the steam consumption does not exceed 32 lb. per brake hp-hour. With the same steam pressure and a 28-in. vacuum the steam consumption drops to 30 lb. per brake hp-hour. When using live steam at 120 lb. pressure and exhausting into a 26-in. vacuum, the steam consumption is 19.2 lb. per brake hp-hour and with the same steam pressure and a 28-in. vacuum it is 17.5 lb. per brake hp-hour. This machine is also

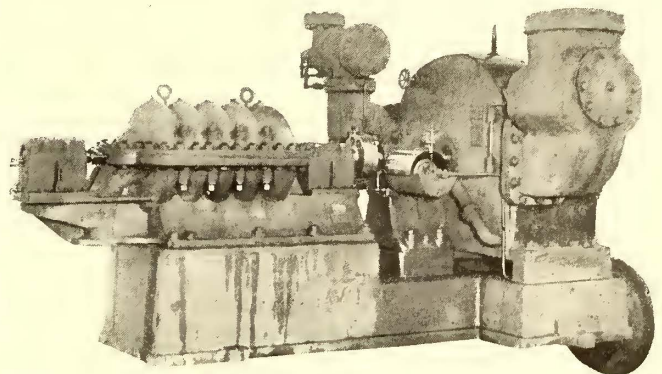


Fig. 4—Turbine Operating a Pump Delivering 500 Gal. per Minute Against 1400-ft. Head

required to run with 100 lb. steam pressure non-condensing.

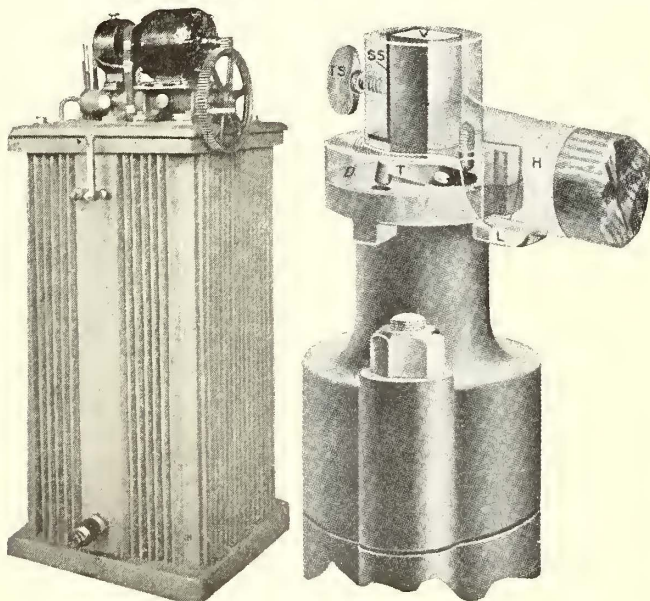
The turbine shown in Fig. 4 differs from those described in that the impellers of the directly connected centrifugal pumps run at the same speed as the impulse wheel of the turbine itself. This unit operates with steam at atmospheric pressure, exhausting into a 24-in. vacuum, or with 120 lb. steam exhausting into the same vacuum, or running non-condensing. The pump delivers 500 gal. per minute against 1400 ft. head. Another interesting machine has recently been installed in a manufacturing plant. It is a mixed-pressure turbine, designed to develop 350 hp when receiving exhaust steam at 2 lb. gage and exhausting into a 27-in. vacuum, under which conditions the steam consumption does not exceed 31 lb. per brake hp-hour. This turbine develops 300 kw when receiving steam at 140 lb. and exhausting into a 27-in. vacuum on a steam consumption of

18.5 lb. per brake hp-hour, which, considering the size of the unit, is better than could be obtained with many reciprocating engines. A mixed-flow turbine of this type is especially advantageous where it is desired to increase the output of an existing plant and where steam is required for other purposes in addition to power production.

The auxiliary power required for the condensing plant by an exhaust turbine is small, the current consumed by the electric-driven auxiliaries amounting to not more than 3 per cent of the current developed by the turbine itself. Due to the possibility of shutting off nozzles as the load decreases, the De Laval turbine has a flat efficiency curve, giving remarkably good performances even at quarter load. This efficiency is retained indefinitely, as there is no leakage past valves or piston rings due to wear.

INDUCTION TYPE POTENTIAL REGULATORS

The motor-operated single-phase induction regulator shown in the accompanying illustration embodies the several improvements recently made in this line by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. Although the general design of these regulators remains unchanged, modifications have been made to insure a higher degree of satisfactory oper-



Induction Type Potential Regulator

Automatic Air-Brake Lock and Handle

ation and longer life. The skeleton frame construction of the new type single-phase potential regulator permits the use of a "cast-in" corrugated sheet metal tank which affords a larger and more efficient radiating surface than the cast-iron tanks used with the earlier regulators, thereby insuring a low operating temperature. This type of tank is also less liable to give trouble from oil leakage, which sometimes occurs with the cast-iron tanks on account of unavoidable defects in the castings. In the latter the leaks usually developed after the punchings and windings had been placed in position, thus causing considerable loss of labor in rectification, while it is noteworthy that in the case of the "cast-in" tank a defective tank entails no other loss than the tank itself. In the earlier designs the cast-iron tank was bored out to receive the stator punchings. As this tank was open only at the top, difficulty was sometimes experienced in obtaining an inner cylindrical surface which would be in perfect alignment with the rotor bearings in the cover and bottom of the tank.

Up to and including the 95-kw size, the polyphase regulators have "cast-in" corrugated sheet metal tanks. They are similar to and possess all the advantages of the "cast-in" type of tank. They possess great strength mechanically, have large radiating surfaces and dirt and dust-proof qualities. An oil gage at the

top and a valve as oil drain at the bottom are provided. The regulator is shipped assembled in its case. Above 95 kw the regulators are usually oil-insulated and water-cooled. Boiler iron cases with cast-iron bases and covers are generally used. The single-phase regulator has inherent tendency to vibrate, but this has been overcome in the Westinghouse regulator by a careful design of the bearings and shaft. The moving element is so centered that a uniform air gap is secured. Furthermore, the tendency to vibrate is reduced, due to the low point on the saturation curve at which the magnetic circuit of the regulator is worked. A very agreeable result of the elimination of the vibration is the noiseless operation of the regulator.

ANTI-FRICTION BEARINGS IN PHILADELPHIA

As a result of its tests with anti-friction bearings, as described in Arthur B. Stitzer's article in the *ELECTRIC RAILWAY JOURNAL* of Aug. 27, 1910, the Philadelphia Rapid Transit Company has decided to equip 20 additional cars with Hess-Bright ball-bearing armatures and the Railway Roller Bearing Company's roller bearing journals. Ten of these cars have Brill No. 27-G double trucks and 10 have Brill No. 39-E single trucks. The pioneer installations as described in Mr. Stitzer's article comprise the following: Car No. 2140 with No. 27-G trucks and both types of anti-friction bearings, car No. 2130 with No. 27-G trucks and roller bearings only and No. 1967 with No. 39-E trucks and roller bearings only.

AUTOMATIC AIR-BRAKE LOCK.

An automatic air-brake lock has recently been put on the market by W. R. Kerschener, of New York. The object of the device is to prevent the rear-end valve-stem on a car being turned by a passenger, either by accident or design, thus disarranging the air-brake system and making it impossible for the motorman to operate the brakes from the forward end of the car.

The lock consists of a flat brass washer *D* with an opening in the center, which fits the valve-stem and is held in place by a concealed screw. There are two washers, one for the air valve at each end of the car. There is but one handle, which is used at either end of the car, like the ordinary handle. To apply the lock the washer *D* is put down over the valve-stem at each end of the car and fastened by the concealed screw. The thumbscrew *TS* clamps the handle tightly to the valve-stem, taking up any lost motion. To prevent the screw from denting or marring the valve-stem, a steel shield *SS* is inserted to take the pressure.

From the illustration it will be seen that the handle controlling the air valve can be removed only when the washer is in the proper or neutral position, as the lug *L* must pass through the opening in the rim of the valve casing. Then, as the handle is lifted, the tumbler *T* enters the corresponding hole in the casing, thus firmly locking the valve-stem. The steel shield *SS* prevents the valve-stem from being damaged or battered by nails or wedges and takes up all play or lost motion in the handle, making the valve respond instantly to the slightest movement. With the automatic air-brake lock the motorman cannot take his handle off without locking the valve in the right position.

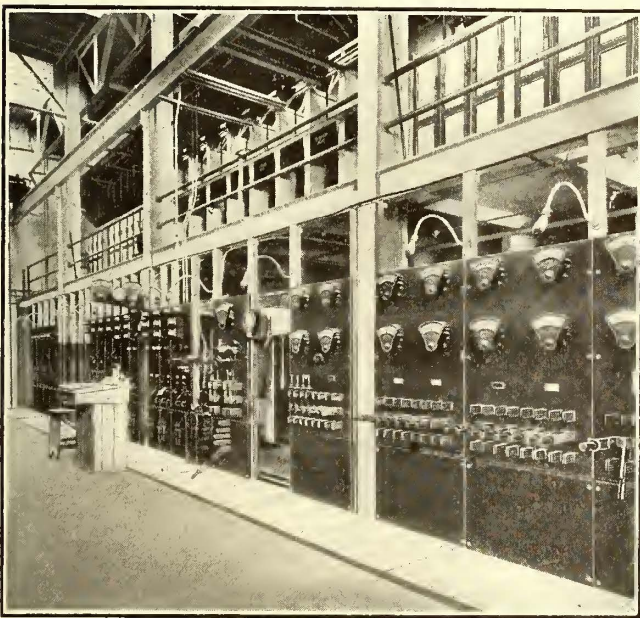
During the end of August the Philadelphia Rapid Transit Company placed in service 10 pay-within cars having twin folding doors instead of sliding doors to close the platforms. If the latter design proves better in operation, all future pay-within cars will have the folding doors. A description of the latter door arrangement was printed in the *ELECTRIC RAILWAY JOURNAL* of Jan. 22, 1910. All of the pay-within cars are being fitted with metal rods for the hand straps and vertical hand posts. The latter are screwed to the longitudinal seating at intervals of about 5 ft. These posts will offer a convenient support for standing passengers who are not holding straps.

FLAMING ARC LAMPS FOR TRACTION COMPANIES

The development of the economical and highly efficient flaming arc lamp has done much to solve for electric traction companies the problem of cheaper outdoor lighting in car yards and of illuminating large indoor areas. A flaming arc lamp gives a light the equal in intensity to 10 ordinary arc lamps. From this it can be seen that the flaming arc means a great saving in the number of lights to be installed. An American flaming arc lamp known as the "Hawthorn" has recently been developed and placed on the market by the Western Electric Company. This lamp has about 3000 cp and is especially advantageous for installations where single light units are required for large areas. The economical installation cost of these lamps is also an important point in their favor. As only one outlet is required for 3000 cp as against 5 to 10 for the same amount of light from enclosed arcs, the initial saving in wiring alone pays for these lamps. Compared with incandescent lamps, the difference in favor of the flaming arc is much greater.

EBONY ASBESTOS-WOOD SWITCHBOARDS

The accompanying illustration shows an ebony asbestos-wood switchboard which was installed by the Johns-Manville Company in Station I of the Pacific Gas & Electric Company, San Francisco. The characteristics asserted for this material are



Ebony Asbestos-Wood Switchboard in a Power Station of the Pacific Gas & Electric Company

that it has high permanent insulating qualities; that it is fire-proof and capable of sustaining high temperatures without disintegration; that it possesses ample mechanical strength, is easily machined and can take a pleasing finish; that it is free from the breakage and defacement incident to stone panels; and that it is impervious to moisture or oil. This material is employed for switchboard panels, high-tension switch tops, switch or fuse bases, barriers and other switchboard fixtures. The usual external finish is a dead black varnish. It is reported that two years' service experienced with this asbestos-wood for electrical work has developed no signs of electrical or mechanical deterioration.

In a test of some 2-in. asbestos-wood switch tops for 60,000-volt switches, 2-in. x 4-in. metal plates were placed on the surface 6 in. apart and the potential raised to 40,000 volts before there was any apparent surface leakage, nor would this voltage puncture those tops which were 2 in. thick. It is asserted that under like conditions marble would have failed at about 10,000 volts to 12,000 volts.

PROPOSED COLLAPSIBLE SEAT CAR

George C. Wing and Frederick W. Hempy, Cleveland, Ohio, have patented a novel combination of collapsible and fixed car seating arrangements whereby the ratio between the seating and the standing capacities can be varied to suit the traffic conditions. The principal feature of the invention is the use of seats, either transverse or longitudinal, on hinges and springs so that they can be folded into a vertical position. In the latter position they will serve as convenient supports for the standing passengers and also as barriers to avoid jostling. A car with such seating could not only carry away the maximum number of passengers from a congested point but it would also provide seats for the long-haul passengers as the load gradually decreased. The locking and unlocking of the seats would, of course, be under the control of the conductor. The invention also includes claims for using other means for the support of the passengers if no seats of any kind are provided.

The inventors suggest that under certain conditions some railways might find it advisable to offer a reduced fare on these cars inasmuch as rolling stock of this kind would carry more riders than the permanent seat types and would cost less to maintain. This suggestion is in line with the European class-fare system because in the fourth-class cars in Germany and some other countries most of the passengers have to stand. The inventors believe that the same plan might be tried in this country for workmen's cars in the morning and evening rush hours, excursion parties, baseball crowds and the like.

DEPRECIATION OF CARDIFF PROPERTIES

A report made by John Allcock, city treasurer of Cardiff, to the finance and electric light and tramways committees on the subject of depreciation states that the importance of the question is apparent from the fact that the capital expenditure on March 31, 1909, reached £768,088, an expenditure, having regard to the mileage, greatly in excess of any similar undertaking in the United Kingdom. In the case of 67 other tramway undertakings, the capital expenditure averages £12,583 per mile of single track, while in Cardiff it is £24,138. The loan period for the money spent on track construction extends to 30 years, and the city engineer has already advised that the average life cannot be considered to be more than about 15 years, and this advice has been strengthened by the fact that the Inland Revenue authorities have recently fixed periods ranging from 12 to 16 years as a basis for the allowance of depreciation in assessing electric tramways for income tax purposes. There is at present a tramways depreciation fund of £19,004, and a tramways reserve fund of £9,952, making a combined total of £28,956. These funds would be used as a nucleus toward making provision for the £89,320 which will be required by the city engineer on account of truck renewals, viz., £7,160 in 1912, £35,320 in 1914 and £46,840 in 1917.

The city engineer contemplates spending additional money to the extent of £127,360, as follows: £14,000 in 1920, £19,320 in 1922, £35,320 in 1926 and £58,720 in 1932. Mr. Allcock thinks it is unnecessary to provide for the expenditure of £58,720 in 1932 by accumulating a depreciation fund, as at the time this particular money is required the original loan will have been repaid. It will, however, be necessary to set aside during the period ending March, 1926, an annual sum of £6,946, which, together with the present funds in hand and compound interest at 2½ per cent per annum, will provide the money as required. The foregoing requirements are exclusive of the annual outlay for repairs as distinct from renewals.

Mr. Ellis, the electrical engineer and manager, is now of the opinion that a depreciation fund is not necessary except for the tramway track as the other plant is likely to last over the periods during which the loans on it must be repaid. But as regards the track, Mr. Ellis says it is simply a question how much it is necessary to put aside each year. Mr. Allcock says that the fear that the rates of the city might be called upon to assist in building up depreciation funds has been discussed by the Council, but that

the source from which the money is derived does not operate upon the abstract question of depreciation. It is either a fact that the wear and tear of the machinery, etc., is greater than that represented by the amounts set aside for sinking funds—in which case extra provision should of necessity be made—or it is not a fact, and until this question is definitely agreed upon he cannot complete his report.

The committees recommended that £6,904 be set aside annually for track renewals. They also agreed that no special depreciation allowance was required for machinery.

CONVENTION NOTES

The following list gives the names of all companies which had made application for exhibit space at the Atlantic City convention up to Sept. 2, 1910, together with the number of square feet of space which has been assigned to them by the committee on exhibits of the Manufacturers' Association:

Name of Exhibitor.	No. of Sq. Ft. of Space.
Acme Indicator Co., Cleveland, Ohio.....	150
Adams-Bagnall Electric Co., Cleveland, Ohio.....	198
Adams & Westlake Co., Chicago, Ill.....	162
Anderson Mfg. Co., A. & J. M., Boston, Mass.....	198
Anglo-American Varnish Co., Newark, N. J.....	150
American Mason Safety Tread Co., Boston, Mass.....	150
American Brake Shoe & Foundry Co., Mahwah, N. J.....	400
Archbold-Brady Co., Syracuse, N. Y.....	150
Atlanta Car Wheel & Mfg. Co., Atlanta, Ga.....	162
Atlas Railway Supply Co., Chicago, Ill.....	150
American Railway Guide Co., Chicago, Ill.....	168
American Railway Supply Co., New York City.....	150
Allis-Chalmers Co., Milwaukee, Wis.....	3367
American General Engineering Co., New York City.....	162
Automatic Ventilator Co., New York City.....	198
American Steel & Wire Co., Chicago, Ill.....	600
American Hoist & Derrick Co., St. Paul, Minn.....	1358
Black Diamond Boring Machine Co., Monongahela, Pa....	162
Barber Car Co., York, Pa.....	40 ft. track
Badger Fire Extinguisher Co., Boston, Mass.....	168
Bayonet Trolley Harp Co., Springfield, Ohio.....	162
Buda Co., Chicago, Ill.....	500
Berry Brothers, Ltd., Detroit, Mich.....	150
Brown, Harold P., New York City.....	324
Baldwin Locomotive Works, Philadelphia, Pa.....	162
Brill Co., The J. G., Philadelphia, Pa.....	1220
Buckeye Engine Company, Salem, Ohio.....	166
Carbolineum Wood Preserving Co., New York City.....	330
Carnegie Steel Co., Pittsburgh, Pa.....	1800
Cooper Heater Co., Carlisle, Pa.....	162
Coleman Fare Box Co., Buffalo, N. Y.....	300
Chicago Varnish Co., Chicago, Ill.....	300
Coin Counting Machine Co., New York City.....	324
Curtain Supply Co., Chicago, Ill.....	300
Cleveland Frog & Crossing Co., Cleveland, Ohio.....	810
Consolidated Car Fender Co., Providence, R. I.....	396
Columbia Machine Works & Malleable Iron Co., Brooklyn, N. Y.....	675
Consolidated Car Heating Co., Albany, N. Y.....	450
Chicago Pneumatic Tool Co., Chicago, Ill.....	486
Dearborn Drug & Chemical Works, Chicago.....	608
Duplex Metals Co., New York City.....	162
Dossert & Co., Inc., New York City.....	150
Dixon Crucible Co., Jos., Jersey City, N. J.....	324
D & W Fuse Co., Providence, R. I.....	198
Duff Manufacturing Co., Pittsburgh, Pa.....	340
Eclipse Railway Supply Co., Cleveland, Ohio.....	162
Economy Oil Cup Co., Augusta, Ga.....	162
Edwards Co., The O. M., Syracuse, N. Y.....	300
Egry Register Co., Dayton, Ohio.....	150
Eureka Tempered Copper Works, North East, Pa.....	168
Emery Pneumatic Lubricator Co., St. Louis, Mo.....	162
Edison Storage Battery Co., Orange, N. J.....	162
Electric Storage Battery Co., Philadelphia, Pa.....	324
Elliott Co., The, Pittsburgh, Pa.....	198
Electric Omnibus & Truck Co., New York City.....	486
Electric Railway Equipment Co., Cincinnati, Ohio.....	375
Electric Railway Improvement Co., Cleveland, Ohio.....	300
Electric Service Supplies Co., Philadelphia, Pa.....	2024
Flood & Conklin, Newark, N. J.....	500
Forsyth Brothers Co., Chicago, Ill.....	500
Ford & Johnson Co., The, Michigan City, Ind.....	648
Name of Exhibitor.	No. of Sq. Ft. of Space.
Galena Signal Oil Co., Franklin, Pa.....	960
Garlock Packing Co., Palmyra, N. Y.....	150
Goldschmidt Thermit Co., New York City.....	396
Grip Nut Co., The, New York City, Chicago, Ill.....	162
Gold Car Heating & Lighting Co., New York City.....	198
Globe Ticket Co., Philadelphia, Pa.....	400
Gould Storage Battery Co., New York City.....	198
General Electric Co., Schenectady, N. Y.....	2280
Hale & Kilburn Manufacturing Co., Philadelphia, Pa.....	450
Home Rubber Co., Trenton, N. J.....	162
Heywood Bros. & Wakefield Co., Wakefield, Mass.....	460
Hunter Illuminated Car Sign Co., New York City.....	168
Hess-Bright Manufacturing Co., Philadelphia, Pa.....	324
Heany Fireproof Wire Co., New York City.....	150
International Register Co., The, Chicago, Ill.....	398
Indianapolis Brass Co., Indianapolis, Ind.....	162
Indian Refining Co., Cincinnati, Ohio.....	162
Jeandron, W. J., New York City.....	162
Johns-Manville Co., H. W., New York City.....	594
Jones & Laughlin Steel Co., Pittsburgh, Pa.....	324
Kenfield-Fairchild Publishing Co., Chicago, Ill.....	
Lagonda Manufacturing Co., Springfield, Ohio.....	162
Lord Manufacturing Co., New York City.....	150
Lorain Steel Co., Johnstown, Pa.....	1500
Massachusetts Chemical Co., Boston, Mass.....	198
McConway & Torley Co., Pittsburgh, Pa.....	450
McGraw Publishing Co.....	
McVicker & Co., W. P., New York City.....	162
Midvale Steel Co., Philadelphia, Pa.....	
Nachod Signal Co., Philadelphia, Pa.....	162
National Car Advertising Co., Chicago, Ill.....	225
National Carbon Co., Cleveland, Ohio.....	297
National Brake & Electric Co., Milwaukee, Wis.....	648
National Lead Co., New York City.....	
National Brake Co., Buffalo, N. Y.....	324
National Lock Washer Co., Newark, N. J.....	324
New York Switch & Crossing Co., Hoboken, N. J.....	324
Niles Car & Manufacturing Co., Cleveland, Ohio.....	162
Nuttall Co., R. D., Pittsburgh, Pa.....	504
Ohio Brass Co., Mansfield, Ohio.....	594
Ohmer Fare Register Co., Dayton, Ohio.....	864
Pay-As-You-Enter Car Corporation, New York City.....	
Philadelphia Electrical & Manufacturing Co., Philadelphia, Pa.....	162
Pyrene Manufacturing Co., New York City.....	150
Poole Bros. Co., Chicago, Ill.....	162
Pennsylvania Steel Co., The.....	1531
Pantasote Co., New York City.....	830
Presto Co., The, New York City.....	198
Q M S Co., The, Plainfield, N. J.....	200
Rail Joint Co., New York City.....	675
Railway Roller Bearing Co., Syracuse, N. Y.....	324
Ramapo Iron Works, Hillburn, N. Y.....	150
Rooke Automatic Register Co., Providence, R. I.....	150
Reiter, G. C., Canton, Ohio.....	115
Recording Register and Fare Box Co., New Haven, Conn.....	198
Roebbling's Sons Co., John A., Trenton, N. J.....	396
Selah & Hoopes, Philadelphia, Pa.....	162
Smith-Premier Typewriter Co., Syracuse, N. Y.....	300
Sterling Varnish Co., Pittsburgh, Pa.....	300
Stromberg-Carlson Telephone Manufacturing Co., Rochester, N. Y.....	300
Standard Steel Works Co., Philadelphia, Pa.....	486
Standard Underground Cable Co., Pittsburgh, Pa.....	324
Standard Coupler Co., New York City.....	300
Standard Paint Co., New York City.....	150
Symington Co., T. H., Baltimore, Md.....	200
Star Brass Works, Kalamazoo, Mich.....	150
Southern Exchange Co., New York City.....	
Speer Carbon Co., St. Marys, Pa.....	396
Standard Motor Truck Co., Pittsburg, Pa.....	324
Sherwin-Williams Co., Cleveland, Ohio.....	198
Smith Heater Co., Peter, Detroit, Mich.....	324
Templeton, Kenly Co., Chicago, Ill.....	
Torner Automatic Switch Co., Ft. Smith, Ark.....	486
Titan Steel Casting Co., Newark, N. J.....	710
Trolley Supply Co., Canton, Ohio.....	198

Tool Steel Gear & Pinion Co., Cincinnati, Ohio.....	150
Transportation Equipment Co., New York City.....	150
Taylor Electric Truck Co., Troy, N. Y.....	810
Underwood & Co., H. B., Philadelphia, Pa.....	162
U. S. Electric Signal Co., West Newton, Mass.....	486
U. S. Metal & Mfg. Co., New York City.....	198
Under-Feed Stoker Co., Chicago, Ill.....	450
Universal Safety Tread Co., Boston, Mass.....	150
Van Dorn Co., W. T., Chicago, Ill.....	216
Watson-Stillman Co., New York City.....	300
Williams & Co., J. H., Brooklyn, N. Y.....	198
Warren Webster & Co., Camden, N. J.....	162
Whitmore Manufacturing Co., Cleveland, Ohio.....	324
West Disinfecting Co., New York City.....	150
Wallace Supply Co., New York City.....	340
Wheel Truing Brake Shoe Co., Detroit, Mich.....	150
Walker & Bennet Manufacturing Co., New York City.....	210
Westinghouse Companies, East Pittsburgh, Pa.....	2750
Western Electric Co., New York City.....	594
Whipple Supply Co., New York City.....	300
Wonham, Sanger & Bates, New York City.....	340
Wharton, Jr., & Co., Wm., Philadelphia, Pa.....	996
Yale & Towne Manufacturing Co., New York City.....	324

The right to exhibit space is limited to members of the American Street & Interurban Railway Manufacturers' Association. Those manufacturers of electric railway apparatus who are members of this association and have not yet engaged space, or who wish increased space, should apply to K. D. Hequembourg, vice-president in charge of the exhibits, Walker & Bennett Manufacturing Company, Dunkirk, N. Y. Manufacturers who are not members of the Manufacturers' Association should apply for membership to Charles C. Castle, vice-president in charge of membership, U. S. Metal & Manufacturing Company, 165 Broadway, New York.

PROGRAM OF THE CONVENTION

The program of the papers and reports of committees to be presented at the sessions of the different associations was published on page 304 of the ELECTRIC RAILWAY JOURNAL of Aug. 20.

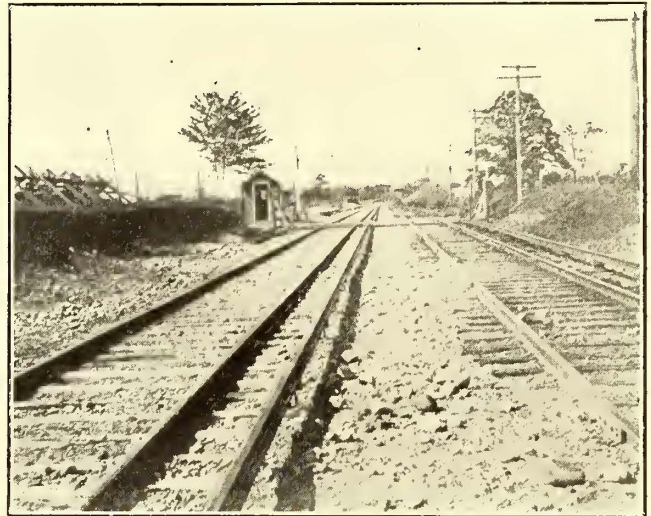
DOUBLE TRACKING THE ALBANY SOUTHERN RAILROAD

The Albany Southern Railroad, which was the pioneer third-rail interurban line in New York state, has been double-tracked this year from the east end of the Rensselaer viaduct south to Electric Park on Kinderhook Lake, a distance of 17 miles. Work was commenced in November, 1909, and was prosecuted continuously through the winter in order to have the second track completed in time for handling the heavy summer excursion business. The work was finished on July 3. The second track is located to the west of the original single track for most of the distance, but in several places the original track was shifted to the east or entirely abandoned and both tracks laid on new right of way to eliminate sharp curves and steep grades. About 3½ miles of the old track was moved from its original bed.

The preparation of the sub-grade for the second track and the shifts of the original track were carried on without any interference with traffic. This was particularly difficult because there are no over-head feeder cables and the third-rail could not be disconnected or moved without shutting down the entire section between substations and delaying regular cars. Each move had to be planned ahead and before the third-rail was disconnected a temporary jumper cable was strung on the high-tension poles. Owing to the severe freezing weather which prevailed while the heavy grading was in progress most of the excavation in dirt and gravel banks was blasted out in front of the steam shovels.

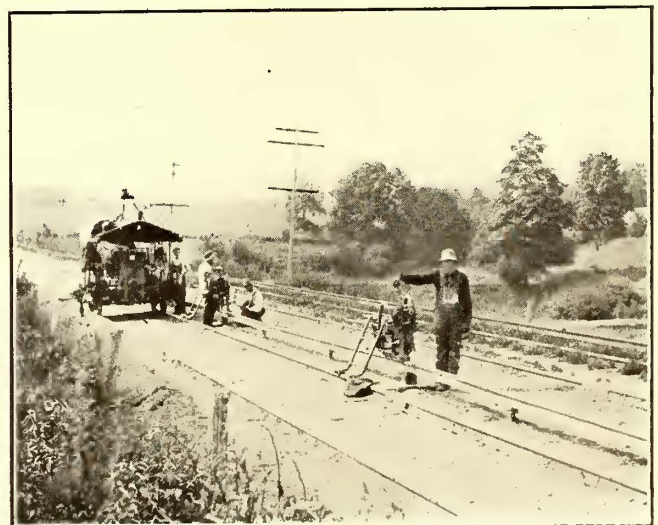
The new track is laid with 80-lb. O. S. C. E. rails and Continuous joints bonded with brazed binds installed by the Electric Railway Improvement Company. The third-rail, which is placed between the old and the new track, is a 60-lb. section of low carbon steel. It is supported at every sixth tie by composition insulators resting on malleable iron supports. The

old third-rail, which is on the outside, is supported on wooden insulators. At road crossings the new third-rail is connected by underground cable jumpers of 750,000 cir. mil capacity. When the new third-rail was installed both the old and the new were sectionalized and cross-connected at two points between substations and section break switches were installed so that in the event of grounding or disconnecting one third-rail the other rail can be used for carrying current around the fault.



Albany Southern Railroad—Double Track Near Sweet's

One of the accompanying engravings shows a bonding car supplying current for two presses working simultaneously on opposite ends of one section of the third-rail. The old single-track plate girder bridges were originally designed for a 97-ton locomotive loading. To accommodate the second track the abutments were extended out and a new heavy center girder put in after one of the original girders had been moved out to form a side girder. A number of the smaller stations and road crossing shelters were moved across the track over the old third-rail without breaking it. Since the double track has been in service, the running time of limited trains between Albany



Albany Southern Railroad—Bonding Third Rail of Second Track

and Electric Park, 18 miles, has been reduced to 41 minutes against 1 hour under the single-track schedule. A marked increase in traffic has been noted since the second track was put in service, the running time reduced and all delays at sidings eliminated.

The reconstruction was done under contract by the construction department of J. G. White & Company.

News of Electric Railways

Bids Asked for Construction of Subways in New York

On Sept. 1, 1910, the Public Service Commission of the First District of New York began advertising for bids for the Tri-Borough Subway System, which will cost, it is estimated, more than \$100,000,000, probably in the neighborhood of \$120,000,000 or \$125,000,000. The bids for construction, equipment, operations and maintenance, all by private capital, will be opened on Oct. 20, 1910, and the bids for construction alone by sections, with city money, will be opened on Oct. 27, 1910.

The Tri-Borough System includes the Broadway-Lexington Avenue Subway, with elevated extensions in the Bronx, one to Pelham Bay Park and the other out to Jerome Avenue, also the Canal Street crosstown subway, and the Broadway-Lafayette Avenue loop in Brooklyn, crossing the Williamsburg and Manhattan bridges and connecting with the Centre Street subway in Manhattan, now almost completed, also two extensions to the Fourth Avenue subway, Brooklyn, one from Forty-third Street south to Fort Hamilton and the other from Fortieth Street by way of New Utrecht Avenue to Coney Island.

The bids to be opened on Oct. 27, 1910, are asked for construction along with municipal money of certain portions of the system. The commission states that the

(1) All expenses for administration, maintenance and operation.

(2) All taxes, rates and assessments except special assessments.

(3) For the first three years of the term, the contractor shall pay all expenses of maintenance as part of the operating expense. After that he shall set aside a depreciation fund to be fixed by the commission.

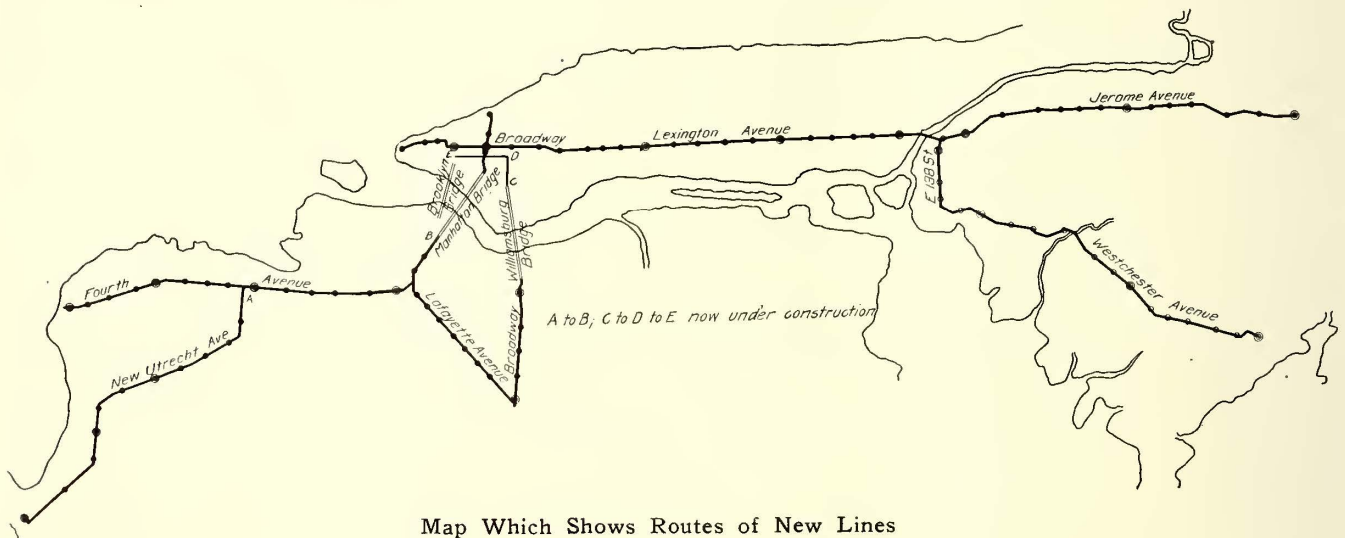
(4) .. per cent of the cost of construction to be set aside quarterly as an amortization fund. (The contractor to name the rate in his bid.)

(5) An amount sufficient to pay off within 10 years any discount on bonds issued to pay the cost of construction and equipment.

(6) One-quarter of 1 per cent of the revenue as a contingent reserve fund until such fund reaches 5 per cent on cost of construction and equipment. This fund to be used to meet deficits in operation, and any surplus is to be shared with the city.

(7) .. per cent, not to exceed 6 per cent per annum, payable quarterly to the contractor and to the city as interest on cost of construction, real estate, etc.; and interest at 4½ per cent to the city prior to the beginning of operation.

(8) After such payments are made, all amounts remain-



Map Which Shows Routes of New Lines

Board of Estimate has indicated that it can spare only \$60,000,000 for construction work this year. Consequently, as it is important that the entire system should be completed at the same time, the commission now asks bids only on those sections which will take the longest time to construct. There are the principal portions of the Broadway-Lexington Avenue route, the Canal Street route and the Broadway-Lafayette route in Brooklyn. These comprise 21 sections and bidders for construction may bid on any one or more of them.

If an acceptable bid is not obtained for construction, equipment and operation of the Tri-Borough System, involving the use of private capital, it will become necessary to accept bids for municipal construction only to the extent of \$60,000,000. In this event, it is stated, the commission next year will invite bids for the remaining sections of the system to the extent to which the Board of Estimate and Apportionment feels that it can go in making appropriations for rapid transit work, and in the year following will invite bids for the remaining parts of the work.

The contractor must bid for the right to the possession of the railroad for a term of years. The term of operation begins when any part of the railroad is declared by the commission to be completed and ready for operation.

From any income and increase derived by the contractor in constructing, equipping, maintaining and operating the railroad he will deduct annually:

ing shall be divided share and share alike between the contractor and the city.

The contractor must set aside every year the amounts for amortization and invest and reinvest the amortization fund. He is obliged to pay interest on bonds or other evidence of indebtedness issued by him and pay and discharge the cost of construction at the specified rate. The motive power shall be electricity, so used as to involve no combustion in the tunnels nor any injury to the purity of the air. The commission, in future, may permit the introduction of any superior method of generating or transmitting power if such may be invented.

With the consent of the commission, the contractor may begin the operation of a portion of the road before the whole is completed.

The right is reserved by the commission to allow other railroads to use the tracks of the railroad if the contractor shall not require the use of such railroad to its full capacity.

The rate of fare to be charged is fixed by the following provisions:

"The contractor shall not during the time hereof charge for a single fare upon the railroad to exceed the sum of 5 cents unless otherwise permitted by the commission."

No part of the road or stations may be used for advertising purposes and no trade shall be allowed except such sale of newspapers and periodicals as may be permitted by the commission.

The contractor is obligated to keep up the road and its equipment.

On giving one year's notice in writing to the contractor, the city may terminate the contract at any time after the expiration of 10 years from the date of first operation.

Situation in Detroit

The traction settlement in Detroit is being complicated by the introduction of irrelevant issues by the candidates in the municipal election. George P. Codd has refused to be a candidate for the Republican nomination for Mayor. William B. Thompson, formerly Mayor of Detroit, who was defeated two years ago by Mr. Breitmeyer, the present Mayor, has announced his candidacy for the nomination for Mayor on the Democratic ticket, and he has publicly stated the platform which he will advocate. He favors municipal ownership of street railways; the continuance of the Hally ordinance suit, which involves a judicial determination of the value of the property of the Detroit United Railway, and the acceptance of the proposal of the Michigan United Railways to build a north and south belt line, to be purchased by the city at will.

In May an ordinance was introduced in the Council to revoke the franchises of the lines now being operated by the Detroit United Railway at a 3-cent fare, because it was said that the company was not complying with the terms of the grants to the company. The resolution was referred to the committee on franchises of the Council, where it has since remained. Recently an effort was made by Alderman Garvey to bring the ordinance before the Council again, but the sentiment of those in attendance at the session was against further pyrotechnics of this kind.

On Aug. 31, 1910, Mayor Breitmeyer was reported to be preparing a final proposition for submission to the Detroit United Railway. The Mayor says that if a franchise settlement ordinance is not passed he will advocate the passage by the Legislature of a law permitting the condemnation of property with a view to taking over the Detroit United Railway. The Mayor will rely on the Council to pass his proposal to revive the committee of fifty franchise, and prepare it for submission to the voters at the November election; to pass on a street car heating and ventilating ordinance as recommended by Corporation Counsel Hally; to submit to the people the proposal of the Michigan United Railways to build a north and south belt line. The Mayor has also announced that he will urge the Council to refuse the request of President Hutchins of the Detroit United Railway to add the cost of a new appraisal of the property of the company instead of having the company bear this expense.

In reply to the suggestion made on Aug. 2, 1910, by Mayor Breitmeyer that the Detroit United Railway accept the committee of fifty franchise with a "fair" valuation, President Hutchins of the company, under date of Aug. 30, 1910, said:

"Your favor of Aug. 2, 1910, came during my absence. When received upon my return I learned you were absent, and for that reason have delayed a reply until now.

"We are in the attitude of having promised that we would operate our railways in Detroit at the bare cost of operation, including the legal rate of interest upon their present actual value. And we have agreed that this value may be determined by a high court of arbitration, composed of three of the most distinguished judges in the country. I am convinced from past experiences that such conditions as we may know to be equitable, if named by ourselves, would result only in controversy, political and otherwise, and I therefore believe it to be altogether best that we should adhere to the principle enunciated by yourself and outlined above. I therefore again urge that steps be continued for ascertaining the present value of our railway properties in Detroit by such public methods as will win the confidence both of the public and of the owners of these properties. In the meantime, we are expending this year for extensions and for the acquirement of additional equipment and other betterments more than \$1,500,000, a sum which includes not only the company's entire earnings from all sources, but such additional capital besides as we have been able to control during the present agitation of our affairs.

"It may be mentioned that there has been instituted in the United States Circuit Court some litigation under what is known as the 'Hally ordinance,' which involves a judicial determination of the value of our properties. Possibly you may think it unnecessary, in view of this action, to continue an inquiry under the plan now in contemplation by the Common Council, thus avoiding duplication of labor and expenses; but whatever way the facts are ascertained, whether by court proceedings or by a continuance of your inquiry through the Common Council and a high court of arbitration, we reiterate our adherence to the principle that we will operate at any rate of fare necessary to provide the service and a fair rate of interest on the value of the property. With such a principle once established, it would be possible to meet all reasonable demands for extensions."

Plans of the Philadelphia & Suburban Elevated Railroad.

S. S. Neff, president of the Philadelphia & Suburban Elevated Railroad, Philadelphia, Pa., has addressed to the Mayor of Philadelphia and the citizens of that city a letter in which he submits a plan for the development of high-speed rapid transit lines between downtown Philadelphia and outlying sections of the city, with particular reference to high-speed operation east and west of the business center of the city, which is to be separate and distinct from the high-speed lines to operate north and south of Market Street. The subway lines of the Philadelphia Rapid Transit Company run practically in a straight line east and west, and serve the territory between Sixty-ninth Street and the Delaware River, a distance of about 7 miles. Mr. Neff suggests that elevated lines should be constructed on Lancaster Avenue and Woodland Avenue, with additional elevated tracks between Thirty-second Street and the Schuylkill River Bridge, dispensing with the service of the surface car lines now operated in the subway and around the City Hall, and in their stead to operate elevated trains from Lancaster Avenue and Woodland Avenue around the City Hall, and thus provide for the construction of an east and west subway under the City Hall for the straight movement of trains between Sixty-ninth Street and the Delaware River.

It is proposed by the Philadelphia & Suburban Elevated Railroad, first, to build two subway tracks under Broad Street, extending from the City Hall to York Street, with a loop terminal under the Parkway at City Hall; an incline approach from York Street to connect with elevated lines extending west of Strawberry Mansion, northeast to Frankford and north to Wayne Junction, with possible steam railroad connections in the vicinity of North Philadelphia and Wayne Junction. The plan submitted shows the location of the several suburban steam roads from Germantown, Chestnut Hill, Roxborough and Manayunk, which can be used for through service over the lines proposed to be built by the Philadelphia & Suburban Elevated Railroad. The plan also shows how, in the event of the steam roads not desiring to turn their local traffic over to the subway, elevated extensions could be made through Germantown and Chestnut Hill from Wayne Junction and to accommodate Roxborough, Manayunk, Conshohocken and Norristown by an extension from Twenty-ninth Street and Lehigh Avenue.

The company, in its application to City Councils, has asked for a right extending over a period of 50 years, which time is necessary for the accumulation of a sinking fund to pay off the bonds.

Association Data Sheet on Education

The committee on education of the American Street & Interurban Railway Association has sent a letter to member companies of this association referring to the previous reports on education and summarizing briefly the suggestions contained in them. This year the committee is planning to submit a progress report and asks for the following information: (1) Have you tried any new experiments this year in training your young employees? (2) What are the results? (3) Have you any suggestions to make to the committee regarding its work? The letter and report are signed by the committee on education, Prof. H. H. Norris (chairman), Prof. A. S. Richey, Prof. D. C. Jackson, R. E. Danforth, J. F. Calderwood and W. F. Kelly.

Interstate Line Completed.—The Wahpeton-Breckenridge Street Railway has been completed and placed in operation between Wahpeton, N. D., and Breckenridge, Minn.

Office in New York for Second District Commission.—The Public Service Commission of the Second District of New York, the jurisdiction of which extends to the public service corporations in New York State outside of Greater New York, has established an office in New York City in the tower of the Metropolitan Life Insurance Company's building, which is located at Twenty-third Street and Madison Avenue.

Hearing on Extension of Riverbank Subway.—A hearing was given by the Boston Transit Commission, on Sept. 2, 1910, upon the proposal to extend the westerly terminus of the Riverbank subway in Boston from the Charlesgate east to the junction of Commonwealth Avenue and Beacon Street. Property owners in the vicinity appeared to be about evenly divided upon the matter. President Bancroft, of the Boston Elevated Railway, said that the extension proposed was 1700 ft. long, that it would cost \$250,000, and save only a minute in the running time. The company preferred the terminus which was originally planned on account of its lower cost and greater simplicity of operation. The railroad commission has taken the case under advisement.

Appointments to National Stock and Bond Commission.—On Sept. 3, 1910, President Taft announced his appointments to the new stock and bond commission, which will investigate the question of bringing future issues of railroad securities under the supervision and control of the Interstate Commerce Commission. Arthur T. Hadley, president of Yale University, is named as chairman of the commission. The other members are Frederick N. Judson, St. Louis; Frederick Strauss, New York; Walter L. Fisher, Chicago, and Prof. B. H. Meyer, Madison, Wis. In discussing his appointment as chairman of the commission, Mr. Hadley said: "I do not care to go into details in regard to the matter at the present time. I presume that the work will take through the fall and well into the winter. About the work of the commission, I do not care to say anything until after I have met the other members. If the position on the commission would in any way interfere with my duties as president of Yale I would have declined the appointment. However, it will not interfere and arrangements have been made to carry on both."

Report on Municipal Subway System for Toronto.—James Forgie, of Jacobs & Davies, New York, N. Y., who were engaged by the city of Toronto to report upon a proposed system of underground and surface railways for Toronto to relieve congestion in the business district and afford rapid transit to the outlying districts, submitted the report of the firm to the Mayor and Board of Control of Toronto on Sept. 1, 1910. In brief the report recommends the construction of a complete rapid transit system at a cost of \$23,000,000, and a temporary system at a cost of \$9,375,000. The complete system would be 11.64 miles, and the cost per mile would be, approximately, \$2,000,000. The ideal system as dealt with by the engineers consists of the following underground system: From Front Street and Yonge Street northeast to Broadview Street and Danford Street; from Front Street and Yonge Street northwest to Keele Street, West Toronto; from Front Street and Yonge Street north to St. Clair Avenue. All these lines should be connected with surface lines on the north, so as to form a circular belt. The estimated cost of the entire system in accordance with this suggestion is \$23,000,000. Such a system would be operated at a loss during the first few years, but would be self-sustaining by 1921. If the subway system, which the engineers consider ideal, was operated in connection with the Toronto Railway, the entire system would be self-sustaining. The report recommended that the question of subways east and west, or northeast and northwest, should be left in abeyance until some decision has been reached regarding the diagonal streets. The report proposed for temporary relief and as part of a system to be completed later a subway north and south, from the Union Station to St. Clair Avenue, to cost \$5,540,000 via Bay Street, \$6,762,000 via Yonge Street, and \$6,825,000 via Victoria Street.

Financial and Corporate

New York Stock and Money Market

September 6, 1910.

After the three days' holiday the stock market resumed operations to-day in the old half-hearted way that has characterized it for several weeks. Under the pressure of a moderate volume of offerings the market sold off an average of a point on active issues. The trading was very light and was almost entirely professional. There was practically no outside interest in the market and little or no buying of securities for investment. Interborough stocks continue to be among the most active in the market and to show less inclination than many others to decline.

The money market is in the same easy condition. Rates quoted to-day were: Call, 1 $\frac{3}{4}$ to 2 per cent; 90 days, 3 $\frac{3}{4}$ to 4 per cent.

Other Markets

Trading in the Philadelphia stock market has been dull, but tractions have had their full share of attention. Rapid Transit and Union Traction have both been fairly well offered but prices have remained unchanged.

In the Chicago market there has been practically no trading in tractions. A few shares of Chicago Railways Series 2 have been offered, and the price has remained steady at about 16. Elevated stocks have not been in the market.

Massachusetts Electric continues to be fairly active in Boston, with prices for both issues a trifle under those prevailing before the holiday. There has been no other trading in tractions.

The interest in tractions in Baltimore has been confined to the bonds of the United Railways. These have sold fairly well, but prices are not changed.

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

	Aug. 30.	Sept. 6.
American Railways Company.....	344	344
Aurora, Elgin & Chicago Railroad (common).....	*50 $\frac{3}{4}$	*50 $\frac{3}{4}$
Aurora, Elgin & Chicago Railroad (preferred).....	90	85
Boston Elevated Railway.....	a126 $\frac{1}{2}$	a126 $\frac{1}{2}$
Boston & Suburban Electric Companies.....	*15	*15
Boston & Suburban Electric Companies (preferred)...	*74	*74
Boston & Worcester Electric Companies (common)...	a10	a10
Boston & Worcester Electric Companies (preferred)...	36	a37
Brooklyn Rapid Transit Company.....	74 $\frac{3}{8}$	74
Brooklyn Rap. Transit Company, 1st pref. conv. 4s....	82 $\frac{1}{4}$	82
Capital Traction Company, Washington.....	a131	*131
Chicago City Railway.....	a195	a195
Chicago & Oak Park Elevated Railroad (common)...	*3 $\frac{1}{4}$	*3 $\frac{1}{4}$
Chicago & Oak Park Elevated Railroad (preferred)...	7 $\frac{1}{4}$	*7 $\frac{1}{4}$
Chicago Railways, ptctg., ctf. 1.....	a75	a75
Chicago Railways, ptctg., ctf. 2.....	a16 $\frac{1}{2}$	a16 $\frac{1}{2}$
Chicago Railways, ptctg., 3.....	a8	a8
Chicago Railways, ptctg., ctf. 4.....	a5 $\frac{1}{2}$	a5 $\frac{1}{2}$
Cleveland Railways.....	*91 $\frac{1}{2}$	*91 $\frac{1}{2}$
Consolidated Traction of New Jersey.....	a73	a73
Consolidated Traction of N. J., 5 per cent bonds....	a103	a103
Detroit United Railways.....	*45	*45
General Electric Company.....	144 $\frac{3}{4}$	140 $\frac{7}{8}$
Georgia Railway & Electric Company (common)....	107 $\frac{1}{2}$	109
Georgia Railway & Electric Company (preferred)....	*86	*86
Interborough-Metropolitan Company (common)....	17 $\frac{1}{8}$	18 $\frac{3}{8}$
Interborough-Metropolitan Company (preferred)....	48 $\frac{1}{2}$	49 $\frac{3}{8}$
Interborough-Metropolitan Company (4 $\frac{1}{8}$ s).....	79	79 $\frac{1}{4}$
Kansas City Railway & Light Company (common)...	a30	a25
Kansas City Railway & Light Company (preferred)...	a68	79 $\frac{1}{4}$
Manhattan Railway.....	*131	133
Massachusetts Electric Companies (common).....	a18	a18
Massachusetts Electric Companies (preferred).....	a82	a81 $\frac{3}{4}$
Metropolitan West Side, Chicago (common).....	a20	a20
Metropolitan West Side, Chicago (preferred).....	a62	62
Metropolitan Street Railway.....	*15	*15
Milwaukee Electric Railway & Light (preferred)....	*110	*110
North American Company.....	68	68
Northwestern Elevated Railroad (common).....	a18	a18
Northwestern Elevated Railroad (preferred).....	*60	a60
Philadelphia Company, Pittsburg (common).....	a44	a44 $\frac{1}{4}$
Philadelphia Company, Pittsburg (preferred).....	a42	a42
Philadelphia Rapid Transit Company.....	17 $\frac{3}{4}$	17 $\frac{1}{2}$
Philadelphia Traction Company.....	a83 $\frac{1}{2}$	a84
Public Service Corporation, 5 per cent col. notes....	a95	a95
Public Service Corporation, ctf.	a101	a101
Seattle Electric Company (common).....	*109	*109
Seattle Electric Company (preferred).....	*98 $\frac{1}{2}$	*98 $\frac{1}{2}$
South Side Elevated Railroad (Chicago).....	a62	60 $\frac{3}{4}$
Third Avenue Railroad, New York.....	8 $\frac{1}{2}$	8 $\frac{1}{4}$
Toledo Railways & Light Company.....	*7	*7
Twin City Rapid Transit, Minneapolis (common)....	*106 $\frac{1}{2}$	108
Union Traction Company, Philadelphia.....	a43 $\frac{1}{4}$	a49
United Rys. & Electric Company, Baltimore.....	a15	a15
United Rys. Inv. Co. (common).....	*31	*31
United Rys. Inv. Co. (preferred).....	54	54
Washington Ry. & Electric Company (common)....	a32 $\frac{7}{8}$	a32 $\frac{7}{8}$
Washington Ry. & Electric Company (preferred)....	a86 $\frac{1}{2}$	*86 $\frac{1}{2}$
West End Street Railway, Boston (common).....	a88	a88
West End Street Railway, Boston (preferred).....	*100	*100
Westinghouse Elec. & Mfg. Company.....	59	59
Westinghouse Elec. & Mfg. Company (1st pref.)....	*125	*125

a Asked. * Last sale.

Annual Report of the American Cities Railway & Light Company

The gross income of the American Cities Railway & Light Company for the year 1909 was \$714,245, as compared with \$547,897 for 1908, a gain of \$166,348, or 30.4 per cent. The increase was due to higher dividend receipts from the stocks of local companies. A statement of the income account for two years follows:

Income.	1909.	1908
Dividends on stocks of local companies.....	\$701,334	\$533,031
Interest on loans to local companies.....	5,965	13,474
Interest on bank balances.....	6,946	1,391
Income from other sources.....	1
Total income.....	\$714,245	\$547,897
Expenses, including taxes.....	28,082	29,501
Net earnings.....	\$686,163	\$518,396
Dividend on preferred stock.....	414,366	414,366
Dividend on common stock.....	269,028
Surplus.....	\$2,769	\$104,030
Previous surplus.....	304,155	200,125
Special income from earnings of previous year.....	250,000
Total surplus, Dec. 31.....	\$556,924	\$304,155

Combined gross earnings of the local companies amounted to \$5,801,238 for the year, a gain of \$365,744, or 6.7 per cent. A comparative statement of the income account of the local companies for two years follows:

	1909.	1908.	Increase.
Gross earnings.....	\$5,801,238	\$5,435,494	\$365,744
Operating expenses and taxes.....	3,360,945	3,280,248	80,697
Net earnings.....	\$2,440,293	\$2,155,246	\$285,047
Interest charges.....	1,251,542	1,228,215	23,327
Balance.....	\$1,188,751	\$927,031	\$261,720
Sinking funds.....	25,500	25,500
Surplus over sinking funds.....	\$1,163,251	\$901,531	\$261,720
Dividends paid.....	799,433	617,175	182,257
Surplus.....	\$363,818	\$284,355	\$79,463

From the surplus the local companies set aside as reserve funds for renewals, betterments and contingencies, \$170,741 in 1909, as compared with \$158,141 in 1908.

The American Cities Railway & Light Company now owns in the aggregate 84.1 per cent of the preferred stock and 89.4 per cent of the common stock of the following companies: Birmingham Railway, Light & Power Company, Memphis Street Railway Company, Little Rock Railway & Electric Company, Knoxville Railway & Light Company and Houston Lighting & Power Company.

J. K. Newman, the president, says in the report: "The results of the operations of the several companies during the past year have been gratifying to the management. The improvement to which your attention was directed in the last annual report as taking place at the beginning of the year was continued throughout the later months. As a result, an increase of \$365,744 in gross earnings, accompanied by an increase of only \$80,697 in operating expenses and taxes, produced an increase of \$285,047 in net earnings.

"One of the serious problems in recent street railway management has been the increasing tendency of damage costs due to accidents. During the past year the Birmingham Railway, Light & Power Company installed gates on all its cars, to be closed by the motorman before starting the car. By the use of these gates, the so-called 'platform accidents' have been almost entirely eliminated, and the expense to the company correspondingly reduced. The success achieved in Birmingham will lead to the installation of similar devices in the other properties in which your company is interested.

"Your company has never had occasion to borrow any money to finance its own requirements or to assist the local companies. The latter are all in excellent financial condition, none of them experiencing any difficulty in selling treasury bonds as fast as the proceeds are required for construction expenditures. As a result, none of the companies has any floating indebtedness, except such as may have been incurred temporarily, pending the sale of the treasury bonds reserved for construction requirements.

"Your company endeavors, as far as practicable, to keep its surplus funds employed by making advances to the local companies as temporary loans; such loans being liquidated when the companies dispose of their bonds."

A compilation giving the results of operation for the years 1903 to 1909, inclusive, shows the following percent-

ages of increases in this period: Gross earnings, 93.8 per cent; operating expenses and taxes, 100.4 per cent; net earnings, 85.3 per cent; interest, 78.6 per cent; surplus, 92.8 per cent; surplus after provision for sinking funds, 88.7 per cent.

Descriptions of the operating companies contain the following information in relation to expenditures for improvements:

"Birmingham Railway, Light & Power Company.—The company has expended over \$6,000,000 in the reconstruction and extension of its property within the past six years. Its physical condition is excellent and the capacity of the property is sufficiently great to handle a large increase in business.

"Memphis Street Railway.—The company has expended within the past five years over \$3,600,000, thereby putting its property in excellent physical condition and providing sufficient capacity to care for a large increase in business.

"Little Rock Railway & Electric Company.—It has expended more than \$1,500,000 upon its property within the past six years. The plant and equipment are consequently in the best of condition and adequate to handle a large increase in business.

"Knoxville Railway & Light Company.—The company has expended for reconstruction and extension within the past six years \$1,900,000. In consequence, the physical condition of the property is the best that can be had and its capacity is sufficient to take care of the growth of business which is assured in the immediate future.

"Houston Lighting & Power Company.—It has expended more than \$400,000 on its property within the past five years, placing the property in excellent physical condition and of sufficient capacity to handle a largely increased business."

American Light & Traction Company, New York, N. Y.—It has been reported in St. Louis that the American Light & Traction Company and the North American Company are likely to be merged soon. James Campbell, St. Louis, is president of the North American Company, and Emerson McMillan, New York, is chairman of the board of directors of the American Light & Traction Company. Mr. McMillan was formerly president of the Laclede Gas Light Company, St. Louis.

Chicago (Ill.) Railways.—On Aug. 20, 1910, the receipts of the Chicago Railways from passengers were more than \$43,000. Up to Aug. 20, 1910, the receipts of the company showed a daily average of \$39,000, indicating a total of \$1,200,000 for the month, an increase of 13 per cent over August, 1909. The extraordinary increase in gross earnings for August is attributed to three causes, namely: The rapid growth of population in the territory traversed; the presence of many visitors attending conventions, and the continued improvement in the company's facilities, represented by the approaching completion of rehabilitation and by the delivery to the company of a large consignment of new cars, which were made available upon some of the West Side lines.

Interstate Railways, Philadelphia, Pa.—It is stated that the plan to issue preferred stock of the Interstate Railways to take up the defaulted bond interest which was made in April, 1910, is again being considered and may be presented in definite form in the near future. Bondholders who favor the plan as being the most expeditious and feasible means of relieving the company from its embarrassment are said to believe that the objections of estates holding the bonds can be overcome, the plan being to purchase at a concession from the estates the preferred stock received in exchange for the overdue coupons. It is thought that there will be no difficulty in finding a sufficient number of individual bondholders willing to take over the preferred stock held by estates in order to assure the success of the plan.

Lancaster County Railway & Light Company, Lancaster, Pa.—The Lancaster County Railway & Light Company has taken over the property of the Columbia (Pa.) Gas Company.

Long Island Railroad, Long Island City, N. Y.—The Public Service Commission of the First District of New York has authorized the Long Island Railroad to issue its

4 per cent 10-year gold debenture bonds to the Pennsylvania Railroad to the amount of \$2,000,000, in payment of money advanced by the latter, which the Long Island Railroad used for the acquisition of property and the construction of additions and betterments. Main line improvements between Winfield and Dunton, for which the Long Island Railroad also asked the commission's authority to reimburse the Pennsylvania Railroad, are left for future decision by the commission.

Metropolitan Street Railway, New York, N. Y.—Judge Lacombe, in the United States Circuit Court, has decided that a committee under an agreement signed by certain minority stockholders of the Metropolitan Street Railway, owning about 5000 shares of stock, shall not be permitted to intervene in the suits of the Pennsylvania Steel Company and the Morton Trust Company against the Metropolitan Street Railway and the New York City Railway. Judge Lacombe referred to his opinion of more than two years ago in a similar request, in which he said that to grant the permission would be contrary to the practice of the court. One large holding by a committee was represented in the suit, the court said, and whatever the result was as to this committee would apply to all others.

Montreal (Que.) Street Railway.—Patrick Dubee, secretary of the Montreal Street Railway, has sent to the stockholders of the company a letter referring presumably to the Canadian Light & Power Company, in which he says: "Owing to the persistent rumors regarding a proposed amalgamation of this company with a new hydro-electric company, your directors would ask the shareholders to withhold any proxies or pledges without the most careful investigation into the merits of the proposed scheme. Your directors have not sufficient knowledge of the rumored deal at this time to pass judgment on the same, but as they have under consideration certain negotiations and plans affecting the future of the company, which will shortly be laid before the shareholders, they would ask that no pledge or proxy be given by the shareholders until such time as the directors lay their ideas before them."

Pennsylvania-New Jersey Railways, Easton, Pa.—The Pennsylvania-New Jersey Railways has been organized under the laws of Delaware with an authorized capital stock of \$5,500,000, of which \$500,000 is 5 per cent preferred stock to hold the capital stock of the Northampton Traction Company and the Easton & Washington Traction Company, for which it has exchanged its own shares. The Northampton Traction Company and the Easton & Washington Traction Company preserve their separate corporate existence and have united in authorizing an issue of 5 per cent. bonds dated May 1, 1910, and due May 1, 1950, secured by a first mortgage on the property of the Easton & Washington Traction Company, located in New Jersey. After the retirement of the \$350,000 remaining first mortgage bonds of the Northampton Traction Company the new bonds will also be a first lien upon the property of this company. The authorized amount of the new bonds is \$5,000,000. Of this amount \$550,000 are to be sold at once for the financial purposes of the company and for carrying out certain physical additions and betterments.

Third Avenue Railroad, New York, N. Y.—At a recent sale of securities of the New York City Railway, aggregating \$4,000,000, which was held to satisfy a judgment by the Pennsylvania Steel Company and the Degnon Contracting Company, attorneys for the receiver of the Third Avenue Railroad purchased the securities which were offered for \$800.

Tri-City Railway & Light Company, Davenport, Ia.—At the annual meeting of the stockholders of the Tri-City Railway & Light Company, to be held on Sept. 15, 1910, action will be taken on the question of authorizing an issue of \$20,000,000 of first and refunding mortgage 5 per cent gold bonds.

West Penn Traction Company, Connellsville, Pa.—The stockholders of the West Penn Traction Company on Sept. 1, 1910, approved the issue of a mortgage to secure \$25,000,000 of bonds, and the agreement with the West Penn Railways and the American Water Works & Guarantee Company. The stockholders of the West Penn Railways also ratified the plan to increase the indebtedness of the company from \$6,000,000 to \$12,000,000.

Traffic and Transportation

Finding of Arbitrators in Connecticut.

The board of arbitration, consisting of Judge William F. Case, Clarence Deming and David F. Fitzgerald, which has been considering the wages and the terms of service of the employees of the Connecticut Company, made public its findings on Sept. 1, 1910. Mr. Deming was chosen by the company to represent its interests. Mr. Fitzgerald was chosen by the men to represent them, and Judge Case was selected by Mr. Deming and Mr. Fitzgerald as the third member of the board. Judge Case and Mr. Fitzgerald signed the findings. Mr. Deming submitted a minority report. The employees of the company are given an advance in wages ranging from one-quarter of a cent an hour in the first year to one cent an hour at the beginning of the sixth year over the rate established by the company on April 9, 1910. The rate for overtime work of five cents an hour above the regular wage remains unchanged.

The new scale dates from June 1, 1910, and is binding on both sides until June 1, 1912. There were formerly two divisions of employees. The men in New Haven, Hartford, Waterbury and Bridgeport were included in the first division, and the employees in the other cities and towns of the State were included in the second division. The wages of the employees in the second division were slightly less than those of the men in the first division. The arbitrators have divided the system into three divisions with New Haven and Hartford in the first division, Waterbury and Bridgeport in the second division and the other cities and towns in which the company operates in the third division. It was decided that the flat rate of 30 cents an hour demanded by the men was not justified, even in New Haven and Hartford.

The sliding scale of wages is mentioned as a system calculated to maintain high efficiency among the employees and was continued for this reason. The conclusion of the report by Judge Case and Mr. Fitzgerald, together with the rates of wages as established by them, follows:

"After a careful review of the situation, therefore, and for the main reasons briefly outlined, we are convinced that the men are entitled to an advance in wages and that the companies have failed to show their inability to pay it, that no economic principle so far unearthed in our proceedings at all disturbs the balance indicated by this conclusion, and that—except in so far as the evidence on the point has been fairly weighed in its bearing directly upon the question of fair and liberal compensation—the conduct and attitude of some of the men during the period of negotiations is removed from our consideration by the explicit terms of the final agreement to arbitrate.

"Two questions remain to be disposed of: (1) The demand of the men for a flat rate, rather than one based upon pay increasing as the term of service increases, and (2) the definite schedule of wages to be fixed.

"We are satisfied that the demand for a flat rate should be denied. The present system of the company is one of obvious merit, if the public right to a carefully maintained standard of efficiency is to be respected, and methods calculated to maintain it and to encourage a recognition of it on the part of the men are to be approved.

"As to the other and final matter with which we are concerned, we submit the accompanying schedule as fairly determining the rates of wages in its respective classes which should be established; and, under the terms of the submission, we so establish these rates as the wages of the motormen and conductor on the respective divisions for the period of two years from June 1, 1910:

	First year.	Second year.	Third year.	Fourth year.	Fifth year.	Sixth year.
New Haven.....	21¾	22¼	23	24½	26	27
Hartford.....	21¾	22¼	23	24½	26	27
Bridgeport.....	21½	22	22¾	24	25½	26½
Waterbury.....	21½	22	22¾	23¾	25	26¼
New London.....	21	22	22¾	23½	24½	26
Stamford.....	21	22	22¾	23½	24½	26
New York & Stamford.	21	22	22¾	23½	24½	26
Meriden.....	21	22	22¾	23½	24½	26
Derby.....	21	22	22¾	23½	24½	26
New Britain.....	21	22	22¾	23½	24½	26
Norwalk.....	21	22	22¾	23½	24½	26
Putnam.....	21	22	22¾	23½	24½	26
Middletown.....	21	22	22¾	23½	24½	26
Torrington.....	21	22	22¾	23½	24½	26

"In the matter of pay for overtime work, we approve and therefore leave undisturbed the existing regulations of the companies."

Mr. Deming in his minority report says that the objective work of the arbitrators was complicated by two extraneous factors—the arbitrators found in operation an increase in wages as the sequel of previous negotiations between the company and its employees and had before it the moral issue raised by the company of a broken agreement. He says that if the subject of the arbitration had been economic and had dated back entirely to an original, instead of a secondary, wage schedule matters would have been greatly simplified. Mr. Deming considered the subject under three groupings—economic, fiscal and moral. In regard to the first he says that by comparing the pay of the employees of the separate companies in 1904, when the Connecticut Company was organized, with the pay which the men receive at present wages have been increased so as nearly, if not quite, to equate the increase in the cost of living, and that the present wage scale is a fair one. His discussion of the fiscal question is concerned largely with the reports made by the company to the Railroad Commission of Connecticut. In regard to the violation of the agreement between the company and its employees, dated April 9, 1910, to which reference was made in the *ELECTRIC RAILWAY JOURNAL* of July 23, 1910, page 162, Mr. Deming says that this phase of the controversy must be deemed vital, and its facts and elements analyzed, as it properly is an integral part of the case. In regard to this Mr. Deming concludes:

"To summarize very briefly this moral and fundamental aspect of the case before the arbitrators, eclipsing all other features, there was a definite and precise contract with the company, subsequently confirmed by the men as principals and on which the counsel for the men offered no refuting evidence before the arbitrating board, and let this whole branch of his case collapse. Practically then the duties of the arbitrators were merely the ascertainment of the immoral breach of the contract, and, if so found, ratifying the wage scale for which the contract provided. On that point, resting on the sanctity of contract the dissenting arbitrator holds the evidence conclusive and refuses to set the seal of arbitration on broken faith.

"And in conclusion he must express his deep sorrow at what he must regard as the moral failure of the arbitration. The board of arbitrators, a pioneer one of its kind in this State, and representing an agency for the adjustment of one of the most serious labor disputes in New England history, has had a great opportunity to which it has failed to respond. By sustaining the agreed scale it could have allowed for the men a handsome increase of their wage; it could have asserted the force that obligation of contract which the constitution of our country denies the right of even a State to impair; it could have impressed on the unions the value of good faith in an epoch when their habit of bad faith has so often—and it is to be feared too justly—been charged by the corporations, and it could have warned the union employees to watch and ward more carefully against bad leadership, and select for their captains men of integrity, intelligence and conservatism. Looked at in its broader sequels with what confidence after such an experience can a corporation failing in this arbitration, with an impregnable moral case and one also with economic strength, appeal hereafter to arbitration on economic grounds alone? An arbitration which might have been epochal for our community has proved far worse than negative in its value as precedent and example.

"It is with profound regret that on such a proposition of the highest moral altitude and import one of the three arbitrators must stand alone."

Finding of Board of Arbitration in Albany Wage Controversy

Reference was made in the *ELECTRIC RAILWAY JOURNAL* of Sept. 3, 1910, page 381, to the decision of the board of arbitration which has been considering the wages of the employees of the United Traction Company, Albany, N. Y. The decision was signed by Rev. Richard H. Nelson and by C. Gordon Reel, who represented the company. Joseph F. McLoughlin, who represented the employees, refused to sign the decision. The finding of the board

was addressed to the United Traction Company and the employees of the company, and the full text of the finding, as made public on Aug. 30, 1910, follows:

"The undersigned were appointed by you to consider the question of an advance in wages to be paid to the employees of the company on and after July 1, 1910.

"We find that the principal ground on which the employees base their request for a 20 per cent advance over the wages paid up to June 30, 1910, is the general increase in the cost of living, and we are of the opinion that this advanced cost of the principal necessities of life should lead employers of labor to make the largest possible addition to the wages paid. If there were no other considerations to be observed, this commission would unhesitatingly recommend that the 20 per cent increase asked by the men should be granted, because we are led to believe that this would not overcome the advance in the cost of living since 1907. But there are other considerations which must be taken into account by those who are to do justice to all parties; and, first, we should ask whether the company is able to pay such an additional amount without injury to those who have invested their money in its stock.

"The commission cannot undertake to express an opinion as to the rightfulness or the wisdom of the course by which the United Traction Company came to be burdened with the large amount of capital stock on which it must now pay interest. We must confine ourselves to facts which have been presented to us and which, to the best of our knowledge, represent the present financial condition of the company.

"We find that, after deducting a sufficient sum to pay 4 per cent on the capital stock of the company, there will remain as a surplus for the year ending June 30, 1910, a sum approximating \$23,900, and we find that this is the only amount known to us from which an increased wage may be drawn. We cannot advise an increase in wages which would make it impossible for the company to pay the regular 4 per cent dividend on its stock, because we hold that such an act would penalize citizens who have invested their money in good faith, and we believe it is contrary to the best interests of any city to discourage the investment of local capital in local industries. We are therefore forced to regard the above-named sum of (about) \$23,900 as representing the fullest present ability of the company to meet the demands of its employees.

"The commission, therefore, recommend, that beginning with July 1, 1910, the company should pay to all of its employees an increase of 4 per cent over the wages paid up to June 30, 1910, and that such rate shall continue until June 30, 1911, except as hereinafter provided—namely: The commission recommend that application should be made by the United Traction Company to the Legislature of New York for the passage of an act to enable the company to charge 1 cent for each transfer issued within the limits of the cities in which the company operates. We have calculated that such an additional charge for transfers would enable the company to pay its employees a 10 per cent increase over the wages paid up to June 30, 1910, and we agree that such a 10 per cent advance should take the place of the 4 per cent increase heretofore awarded as soon as such an act of the Legislature shall become effective.

"In reaching this conclusion we point to the fact that the 4 per cent increase from July 1, 1910, would make the wages of motormen and conductors 26 cents an hour, irrespective of length of service, and that this is a more favorable rate than is paid in those cities of the State in which the conditions of labor and the cost of living may be compared fairly with those in the cities under consideration. If, as we hope, the Legislature should enable the company to pay this 10 per cent increase motormen and conductors of the United Traction Company would receive 27½ cents an hour, which is equal to the highest wage paid in New York City to men who have served five years or more.

"We do not hold that this award establishes ideal conditions, and we are of the opinion that causes far-reaching in their nature must be removed before the workmen of this country can receive for their services a compensation which will meet the requirements of a progressive civilization, but we offer our decision as representing the best that can be done under present conditions, and we ask the company, its employees and the general public to co-

operate sympathetically in this effort to distribute a burden which should be borne by the many and not by the few. We do not ask the contending parties to bind themselves by an agreement extending beyond June 30, 1911, because we have good hope that conditions affecting both parties may improve before that time, and we believe that with such improvement the company will take steps to meet the just requirements of its employees."

Collision on Lake Shore Electric Railway—More than 20 persons were injured about 10 a. m., on Sept. 4, 1910, when an east-bound limited and a west-bound local collided head-on on the Lake Shore Electric Railway near Allen's Corners, two miles east of Norwalk.

Baseball Signs on Cars—To advertise the baseball games in Toronto, the Toronto (Ont.) Railway uses a metal sign about 2 ft. wide and 9 in. high, attached to the fender. In Chicago a curtain in one of the car windows is used to display signs announcing baseball games between teams in the American and the National leagues of baseball clubs.

Lenox Fares to be Investigated—The Selectmen of Lenox, Mass., have petitioned the Railroad Commission of Massachusetts to investigate the fares in force on the Berkshire Street Railway within the town. The petitioners ask that a 5-cent fare be established between all points in the municipality and that half-hourly service be instituted by the company.

Meeting of the Central Electric Accounting Conference—It has been decided that the meeting of Central Electric Accounting Conference shall be held in Chicago, Ill., on Sept. 24, 1910. The meeting will convene at 10 a. m. in a Chicago hotel, which is still to be selected, to discuss such matters as may come before the conference. At 1 p. m. those in attendance at the meeting will leave for Milwaukee as guests of the Chicago & Milwaukee Electric Railroad.

Objects to Transfer Provision of Albany Company—Samuel D. Miller, Rensselaer, has filed a complaint with the Public Service Commission of the Second District of New York regarding rules and regulations of the United Traction Company, Albany, N. Y., which govern the issuance of transfers between Albany, Troy and Rensselaer. He recites two instances where, because of a change in conductors en route, he was unable to secure a transfer to his destination and objects to the provision of the company that transfers should be asked for at the time fare is paid. Mr. Miller contends that a passenger should be entitled to a transfer at any time prior to arrival at the point where he desires to transfer.

Chicago Traffic Statistics—Traffic statistics of the Chicago (Ill.) Railways for the fiscal year ended Jan. 31, 1910, as compared with the previous fiscal year, follow: Passenger car-miles, 45,993,236 in 1910 and 43,857,066 in 1909; mail car-miles, 164,763 in 1910 and 164,388 in 1909; total car-miles, 46,157,999 in 1910 and 44,021,454 in 1909; revenue passengers carried, 245,510,655 in 1910 and 217,400,335 in 1909; free passengers, 4,303,145 in 1910 and 2,947,287 in 1909; transfer passengers, 177,324,580 in 1910 and 153,295,766 in 1909; total passengers carried, 427,138,380 in 1910 and 373,643,388 in 1909; percentage of revenue and free passengers who used transfers, 73.98 in 1910 and 69.57 in 1909.

Outing of Brooklyn Employees—The second annual picnic of the employees of the Brooklyn (N. Y.) Rapid Transit Company, who are members of the Brooklyn Rapid Transit Employees' Benefit Association, was held at Glendale, Long Island, on Sept. 1, 1910. Unfortunately the weather was inauspicious, but, despite this fact, a goodly number of persons was in attendance. In the afternoon a number of athletic contests were held, and the men, the ladies and the children all participated. In the evening there was a dance. The committee in charge of the picnic announced that the proceeds of the picnic would be devoted to the entertainment of the members of the Brooklyn Rapid Transit Employees' Benefit Association, their wives and friends during the fall and winter months, when it is proposed to give a series of theatrical performances and band concerts in the main club rooms of the association, which are located in East New York.

Personal Mention

Mr. L. F. Vosburgh has been appointed general passenger agent of the New York Central lines.

Mr. Aldis E. Hibner has resigned from the engineering department of the Rochester Railway & Light Company, Rochester, N. Y., to become assistant power engineer of the Toronto (Ont.) Electric Light Company.

Mr. William McDaniel has been appointed superintendent of construction of the Mexico, Santa Fé & Perry Traction Company, Mexico, Mo., which is building an electric railway to connect Mexico, Fulton, Columbia and Hannibal.

Mr. D. B. Rose, for the last four years trainmaster of the Puget Sound Electric Railway, Tacoma, Wash., has resigned to engage in business for himself in Spokane, Wash. Mr. Rose entered the service of the company as a dispatcher.

Mr. J. L. Millspaugh has resigned as superintendent of transportation of the Michigan United Railways, Jackson, Mich., to become connected with the public service properties controlled by W. N. Coler & Company, New York, N. Y., under Mr. J. P. Clark, formerly vice-president and general manager of the Michigan United Railways.

Mr. Jacob Furth, president of the Seattle (Wash.) Electric Company, was selected as one of the delegates of the Seattle Chamber of Commerce to visit China as a guest of the associated commercial bodies of that nation, and sailed from San Francisco for the Orient on Aug. 23, 1910.

Mr. D. T. Pierce has resigned as executive assistant to Mr. Charles O. Kruger, president of the Philadelphia (Pa.) Rapid Transit Company. Mr. Pierce was well known in Philadelphia through his connection with the Pennsylvania Railroad. He has had a long daily newspaper experience, and for seven years was editor of *Public Opinion*. Among his other duties with the Philadelphia Rapid Transit Company Mr. Pierce had charge of the relations of the company with the daily press.

Mr. J. C. Rothery, formerly general manager of the Steubenville & East Liverpool Railway & Light Company, Steubenville, Ohio; the East Liverpool Traction & Light Company, East Liverpool, Ohio, and the Ohio River Passenger Railway, East Liverpool, Ohio, has been appointed general manager of the Monterey Railway, Light & Power Company, Monterey, Mexico. Mr. Rothery was connected with the railway and lighting properties at Steubenville and East Liverpool for five years, and during that time what is known as the Ohio Valley Scenic Route was built between Steubenville and Beaver, a distance of 44 miles.

Mr. Theodore Stebbins, of Herrick & Stebbins, New York, N. Y., has contracted with the directors of the Springfield Light, Heat & Power Company, Springfield, Ohio, to manage the business of that company. Mr. Weare Parsons has been appointed general manager of the company. A new 6000 hp steam turbine station will soon be completed for the company. Mr. Stebbins has also accepted the management of the Mount Vernon Railway & Light Company, Mt. Vernon, Ohio, and Mr. A. J. Darrah has been appointed superintendent of that company. These contracts do not interfere with the connection of Mr. Stebbins with the firm of Herrick & Stebbins.

Mr. Charles A. Brooks has resigned as assistant general manager of the South Shore Traction Company, Patchogue, N. Y. Mr. Brooks has been engaged in electric railway work about seven years. He had two years of practical shop work, both mechanical and electrical, and then acted for a year as assistant superintendent of equipment of an electric railway in Ohio. For two years Mr. Brooks was chief clerk to the superintendent of equipment of the Third Avenue Railroad. He has for the last year been assistant general manager of the South Shore Traction Company, part of whose line is completed and in operation. The operation and purchasing and a part of the construction for this company came under the supervision of Mr. Brooks.

Mr. R. C. Taylor has resigned as superintendent of motive power of the Indiana Union Traction Company, Anderson, Ind., a position which he has held since the fall of

1906. Mr. Taylor has been engaged in electric railway work about 15 years. He was born in Brechin, Scotland, 46 years ago, and was graduated from the science and art school at South Kensington, London. He came to America when a very young man, and was for five years master mechanic of the West Superior Iron & Steel Company. Subsequently he acted for six years as mechanical engineer of the Robinson & Cary Company, Minneapolis, Minn. Mr. Taylor was also connected with the mechanical department of the Twin City Rapid Transit Company and was superintendent of rolling stock equipment of the Brooklyn (N. Y.) Rapid Transit Company.

Mr. J. F. Reardon has been appointed general superintendent of the Salt Lake & Ogden Railway, Salt Lake City, Utah. Mr. Reardon was formerly general superintendent of the Lehigh Valley Transit Company, Allentown, Pa. He was born in Northern Michigan about 37 years ago and entered street railway work when he was about 17 years old with the Twin City Rapid Transit Company, Minneapolis, Minn., and remained with the company for 10 years. After resigning from the Twin City Rapid Transit Company Mr. Reardon became master mechanic of the Everett Railway, Light & Water Company, Everett, Wash., and later was made superintendent of the company. He resigned from the Everett Railway, Light & Water Company to accept the position of superintendent of the Lehigh Valley Transit Company.

Mr. W. H. Evans, who became connected with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to assist in the development and to supervise the construction and equipment of that company's comprehensive new construction and repair shops, has been appointed superintendent of motive power of the Indiana Union Traction Company, Anderson, Ind., to succeed Mr. R. C. Taylor, resigned. Mr. Evans was formerly master mechanic of the International Railway, Buffalo, N. Y., and at one time was master mechanic of the Indianapolis Traction & Terminal Company, Indianapolis, Ind. He entered electric railway work with the Twin City Rapid Transit Company, Minneapolis, Minn. Subsequently he was connected for a short time with the Chicago City Railway. Mr. Evans was first vice-president of the American Street & Interurban Railway Engineering Association in 1908-1909, and acted as chairman of the committee on standards of that association one year. Mr. Evans also served for a time as chairman of the standardization committee of the Central Electric Railway Association.

OBITUARY

Horace G. Platt, president of the Geary Street, Park & Ocean Railroad, San Francisco, Cal., is dead.

Gross earnings of the Kansas City Railway & Light Company for the year ended May 31, 1909, were \$6,627,977, as compared with \$6,175,796 for the previous year and \$5,715,339 for 1907. Operating expenses were \$3,764,788, as compared with \$3,228,174 in 1908 and \$2,909,136 in 1907. Net earnings from operation amounted to \$2,863,189 in 1909, as against \$2,947,622 in 1908 and \$2,806,203 in 1907. Other income of \$5,642, received in 1909, made the total income \$2,868,831. The following deductions from income were made: Taxes and licenses, \$461,743; interest, \$1,424,860; repairing flood damage, etc., \$3,139; sinking fund provision of Corrigan Consolidated Street Railway bond issue, \$55,000; discount on Metropolitan Street Railway Consolidated bonds, issued to retire Grand Avenue Railway bonds, \$60,000; total, \$2,004,742. The net income was \$864,089. This amount, added to the balance of \$680,621 remaining as of June 1, 1908, made a total of \$1,544,710, from which dividends of \$476,105 were paid and \$400,000 appropriated for depreciation and accrued renewals, leaving a final surplus of \$668,605. Following are various traffic results of the last year: Revenue—passengers, 104,950,526; transfer passengers, 45,356,172; gross earnings per car-mile, 22.18 cents; operating expenses per car-mile, 12.75 cents; gross earnings per car-hour, \$2.036; operating expenses per car-hour, \$1.171.

Construction News

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

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

RECENT INCORPORATIONS

*Ohio State Interurban & Electricity Promoting Company, Millersport, Ohio.—Incorporated in Ohio to build an electric railway from Lake Erie to the Ohio River, with a branch to the Indiana State line. The road will pass through 29 counties, and the company will have the right to furnish heat, light and fuel. Capital stock, \$99,000. Incorporators: Albert E. Boone, H. A. Axline, Lawrence S. Climer, Levi Bright and E. O. Boone.

*Buckhannon, Weston & Glenville Electric Railway, Buckhannon, Va.—Incorporated in Virginia to build a railway from Sago to Buckhannon, via Weston and Glenville. Capital stock, \$5,000. Incorporators: S. C. Ruamiselle, L. H. Morrison, H. G. Hall, L. H. Trepett, W. H. Gaston, G. F. Day, C. E. White, D. C. Hall, all of Buckhannon.

Sheridan Railway & Light Company, Sheridan, Wyo.—Application for a charter has been made in Wyoming by this company to build a 13-mile interurban railway in Sheridan. Capital stock, \$800,000. Albert Emanuel and William Sullivan, Dayton, Ohio, promoters. [E. R. J., July 30, '10.]

FRANCHISES

*Montgomery, Ala.—C. F. Woodward and associates have applied to the City Council for a franchise to build a street railway in Montgomery from the railroad depot to the city limits.

Little Rock, Ark.—The Orgenta Street Railway, Orgenta, has asked the City Council for a 50-year franchise to use the Free Bridge and build its tracks on Main Street and Markham Street, in Little Rock.

Sheffield, Mass.—The Berkshire Street Railway, Pittsfield, will ask the Council for a franchise to build a railway in Sheffield.

Milford, Mass.—The Milford, Attleboro & Woonsocket Street Railway, Milford, has been granted a franchise to extend its line in Milford.

*Kalamazoo, Mich.—George Bardeen, Otsego, will ask the City Council for a franchise to build an electric railway in Kalamazoo. This is part of a plan to connect Otsego and Kalamazoo.

New York, N. Y.—Frederick W. Whitridge, as receiver of the Union Railway, New York, has been granted the right by the United States Circuit Court to obtain a franchise to build a double track extension from Westchester Avenue at East 167th Street to connect with the existing tracks of the company in Jerome Avenue.

Southport, N. Y.—The Elmira Water, Light & Railway Company, Elmira, will ask the Common Council for a franchise to extend its Pennsylvania Avenue line in Southport.

Charlotte, N. C.—The Piedmont Traction Company has been granted a franchise to build a railway in Charlotte. This projected 13-mile railway will connect Mount Holly, Charlotte and Gastonia. T. C. Lee, engineer in charge. [E. R. J., Sept. 3, '10.]

Brownsville, Ore.—The Albany Interurban Railway has been granted a franchise to build an electric railway over certain streets in Brownsville. This projected 85-mile railway will connect Albany, Sweet Home, Lebanon, Brownsville and Holley. P. A. Young is interested. [E. R. J., July 30, '10.]

Columbia, S. C.—The Columbia Electric Street Railway, Light & Power Company has been granted a franchise by the City Council to double track and extend some of its lines in Columbia. It is said that construction has already begun on the company's 1-mile extension to Shandon.

Seattle, Wash.—The Seattle Electric Company has been granted a franchise by the City Council to extend its tracks on North Fortieth Street, Wallingford Avenue and other streets in Seattle.

TRACK AND ROADWAY

Montgomery (Ala.) Traction Company.—This company has ordered from the Lorain Steel Company 89-lb 9-in. rails for 1 mile of track which it expects to lay within 30 days. W. J. Ginnian, general manager.

Hanford & Summit Lake Railway, Hanford, Cal.—This company has begun work on its proposed 18-mile electric railway between Hanford and Summit Lake. John B. Rogers, 52 Eleventh Street, San Francisco, chief engineer. [E. R. J., Aug. 6, '10.]

Norwich, Colchester & Hartford Traction Company, Norwich, Conn.—This company has awarded the contract to Ahern Brothers, Plymouth, N. Y., for building its 40-mile railway between Hartford and Norwich, Conn. Construction has been started near Hartford. (E. R. J., Aug. 13, '10.)

St. Johns Light & Power Company, St. Augustine, Fla.—This company, it is said, will soon rebuild its street railway system in St. Johns with heavier rails. T. R. Osmond, general manager.

Waukegan, Rockford & Elgin Traction Company, Waukegan, Ill.—This company has awarded P. W. Ryan, Janeville, the contract for grading its proposed 12 miles of railway between Waukegan and Rockford. J. D. Pope, Waukegan is interested. [E. R. J., Aug. 13, '10.]

Indiana Northwestern Traction Company, Indianapolis, Ind.—This company is said to have secured all necessary franchises and rights-of-way and it is reported that construction will soon start on the proposed interurban railway, which is to connect Cedar Lake, Hammond, Crownpoint and Chicago. Eugene Purtelle, 222 La Salle Street, Chicago, president.

Plymouth, Ind.—Surveys are being made for the proposed electric railway from Bremen to Mishawaka. Neff Bros., Bremen, are interested. [E. R. J., May 14, '10.]

Charles City & Western Railway, Charles City, Ia.—It is said that this company has begun grading near Nora Springs on its proposed railway between Charles City and Rockford. C. W. Hart, president. [E. R. J., May 7, '10.]

***Davenport, Ia.**—The Walsh Construction Company has completed preliminary surveys for a proposed interurban railway to connect Blue Grass, Stockton, Durant, Wilton, Moscow, Atalissa, West Liberty, Downey and Iowa City.

Iowa City (Ia.) Electric Railway.—This company has closed a contract with the Cedar Rapids & Iowa City Electric Light Company to furnish power for the operation of its street cars in Iowa City. J. O. Schulze, general manager.

***Coffeyville, Kan.**—F. S. Hathaway, Coffeyville, has completed surveys for a proposed electric railway between Coffeyville and South Coffeyville, which are about two miles distant.

New Orleans Railway & Light Company, New Orleans, La.—This company has begun work on its extension of the West End line to Spanish Fort, a distance of 1½ miles. A sea wall will be built at a cost of \$50,000.

Maryland Electric Railways, Baltimore, Md.—It is reported that this company will extend its tracks from Marley Station, Baltimore, to a point on the Magothy River in Anne Arundel County. J. F. Heyward, Baltimore, general manager.

Blue Ridge Railway, Hagerstown, Md.—This company is now having surveys made by Crum & Davidson, York, Pa., for its proposed 3-mile railway from Pen-Mar to Monterey, via Highfield and Blue Ridge Summit. R. D. Sefton, Waynesboro, Pa., is interested. [E. R. J., April 23, '10.]

Plymouth & Sandwick Street Railway, Manomet, Mass.—This company is said to contemplate constructing a line to connect Plymouth and Sandwick. The company now operates as far as Manomet. N. H. Dunbar, Manomet, superintendent.

Menominee & Marinette Light & Traction Company, Menominee, Mich.—This company reports that it has completed 1½ miles of new track with 60-lb. T rails to Henes Park, in Menominee.

Nebraska Traction & Power Company, Omaha, Neb.—This company will place contracts during the next month for 10 to 25 miles of grading and overhead electric con-

struction. It will also let contracts for ties and rails. Arthur English, president.

New York, Auburn & Lansing Railroad, Auburn, N. Y.—This company is said to be arranging for the construction of a third-rail electric railway which the Ithaca-Auburn Power Company recently made a part of its application before the Public Service Commission, Second District. H. A. Clark, Auburn, general manager.

***Chenango (N. Y.) Railway.**—Application for a charter will soon be made in New York by this company to build an electric railway from the end of the Binghamton Railway lines in Port Dickinson through Hillcrest Park and thence northward to Chenango Bridge. Frederick W. Parsons, promoter.

North Carolina Traction Company, Danbury, N. C.—This company advises that it will let contracts before Oct. 1 for road construction, bridge work, concrete work and buildings. The main line will be built with 90-lb. steel rails. Twenty miles are now ready for ties and rails. This proposed railway will connect Winston-Salem, Rural Hall, Quebec, Capella, Gap, Wade Mecuni and Campbell, N. C., and Stuart, Floyd and Christiansburg, Va. Headquarters, Southern Pines. H. P. MacKnight, Southern Pines, N. C., general superintendent.

Piedmont Traction Company, Gastonia, N. C.—It is reported that this company will soon let contracts for building its line from Mount Holly to Gastonia, a distance of 16 miles, and also from Charlotte to Mount Holly, a distance of 16 miles. T. C. Lee, engineer in charge. [E. R. J., Sept. 3, '10.]

Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio.—This company is reported to have completed surveys for its proposed 11-mile extension from Woodsville to Elmore and Grand Rapids.

Columbus, Urbana & Western Electric Railway, Columbus, Ohio.—This company is said to have arranged to begin the construction of its 5-mile extension from Fishinger's Bridge, 8½ miles north of Columbus, to Dublin. C. W. Van Gundy, Columbus, purchasing agent. [E. R. J., Apr. 30, '10.]

Muskogee (Okla.) Electric Traction Company.—This company has announced that it will extend its lines to Fort Gibson if the citizens of Fort Gibson build a bridge across the Arkansas River at or near Hyde Park.

Coffeyville-Nowata Railway & Power Company, Nowata, Okla.—This company is said to have completed arrangements for beginning construction work this fall on its proposed 23-mile electric railway to connect Coffeyville, Kan., and Nowata, Okla. W. V. Thraves, Nowata, general manager. [E. R. J., Nov. 2, '09.]

Grand Valley Railway, Brantford, Ont.—This company advises that during the next two weeks it will place contracts for building 2 miles of single track with 80-lb. rails and 12-in. concrete foundation. William P. Kellett, Brantford, general manager.

Cumberland Railway, Carlisle, Pa.—This company announces that its new line from Carlisle to Newtonville, a distance of 12 miles, will be opened to traffic on Sept. 10. W. F. Pascoe, Carlisle, general manager.

Chambersburg & Western Electric Railway, Chambersburg, Pa.—The officials of this company are said to have decided to proceed at once in the building of this proposed electric railway to connect Chambersburg, St. Thomas and Edenville. It is intended to build the line entirely on private right of way. (E. R. J., Aug. 20, '10.)

Central Pennsylvania Traction Company, Harrisburg, Pa.—This company is reported to be extending its Second Street line in Harrisburg to Riverside. The line will be double-tracked to Division Street.

Greenville (S. C.) Traction Company.—This company advises that it has let a contract for paving 5000 ft. of its tracks on Main Street, and expects soon to relay its tracks with new rail and put in new cross ties throughout the territory paved. E. F. Taylor, general manager.

Tennessee Rapid Transit Company, Nashville, Tenn.—This company, it is said, will build six bridges in connection with the construction of its proposed 110-mile railway.

to connect Nashville, Lewisburg, Springfield and Clarksville. Robert L. Burch is interested. [E. R. J., Sept. 3, '10.]

SHOPS AND BUILDINGS

Old Colony Street Railway, Boston, Mass.—This company has begun the construction of its new car house at Brockton.

Menominee & Marinette Light & Traction Company, Menominee, Mich.—This company has built an addition to its car house in Menominee.

North Carolina Traction Company, Danbury, N. C.—This company advises that during the next two months it will place contracts for building two new car houses, depot and freight houses, a repair shop and two steel and concrete bridges. H. P. MacKnight, Southern Pines, N. C., general director.

Montreal (Que.) Street Railway.—This company is said to have begun work on its new car house and repair shops at Youville. The structure will be of plastic bricks and limestone. Messrs. Marchand & Haskell, 164 St. James Street, Montreal, are the contractors. W. A. McNaught, purchasing agent.

Cleburne (Tex.) Street Railway.—This company, it is said, has awarded the contract to J. A. Thomas, Cleburne, for building a brick car house in Cleburne.

POWER HOUSES AND SUBSTATIONS

Montgomery (Ala.) Traction Company.—This company expects to purchase turbines and other equipment for its power plant in Montgomery. W. J. Ginnivan, purchasing agent.

Power, Transit & Light Company, Bakersfield, Cal.—It is stated that this company will soon build in Bakersfield a new reinforced concrete power plant with a capacity of 2000 hp. H. J. Jastro, purchasing agent.

San Diego (Cal.) Electric Railway.—Press reports state that this company will award the contract to the Electric Security Construction Company, Los Angeles, for 750 tons of structural steel for its new power house in San Diego. The capacity of the plant will be 35,000 kw. The engine room will be 160 ft. x 75 ft. and two new engines of the vertical type will be added to the present equipment. The boiler room will contain 48 oil burning boilers in batteries of 6 boilers each.

Federal Light & Traction Company, Denver, Colo.—Sanderson & Porter, New York, have recently contracted with the Westinghouse Electric & Manufacturing Company for two 1250-kva. turbo-generators to be used by this company in its power plant. The generators have the following characteristics: 3-phase, 60-cycles, 2300-volts, 3600 r.p.m. Two La Blanc condensers will be used in connection with the steam turbines. The generator fields will be excited by two 50-kw., 125-volt, 2250 r.p.m., d.c. turbo generators to be used in connection with a Tirrill regulator. The order also includes the necessary transformers, lightning arresters, disconnecting switches and switchboard.

Pueblo & Suburban Traction & Lighting Company, Pueblo, Col.—This company is installing 660 hp of new boilers, an overhead coal bunker, a coal and ash conveyor, a large feed-water heater and mechanical stokers under 2000-hp boilers. It is also arranging plans for cooling towers, condensers, pumps and generating machinery to be installed next year. All communications for this apparatus should be addressed to T. C. Roberts, Pueblo, superintendent.

St. Johns Light & Power Company, St. Augustine, Fla.—This company contemplates installation additional machinery at its power plant, and will install an electric motor at the draw-bridge over which it operates.

Bartlesville (Okla.) Interurban Railway.—This company is building an electric light plant. All material has been purchased and construction is almost complete. The equipment will consist of a 400-kw. generator, direct connected to a compound condensing Chalmers-Corliss engine, and 400 hp. in Babcox & Wilcox water tubular boilers. H. Askin, general manager.

Wheeling (W. Va.) Traction Company.—This company has awarded a contract to the Westinghouse Electric & Manufacturing Company for one 1875-kva low-pressure turbo-generator, 2300-volt, three-phase, and two 500-kw motor-generator sets, 600 volts d.c., and all necessary switchboard panels and instruments.

Manufactures & Supplies

ROLLING STOCK

Frederick (Md.) Railroad expects to purchase six passenger cars and an electric locomotive.

Interurban Railway & Terminal Company, Cincinnati, Ohio, expects to purchase two snow sweepers.

City Railway, Dayton, Ohio, will probably purchase in the near future 20 double-truck prepayment cars with 40-ft. bodies.

Columbus Railway, Light & Power Company, Columbus, Miss., expects to purchase two sets of double trucks with 33-in. wheels and 4-in. axles.

Third Avenue Railroad, New York, N. Y., has ordered a double-truck derrick car from the McGuire-Cummings Manufacturing Company, Chicago, Ill.

Michigan United Railways, Lansing, Mich., has ordered 20 No. 10A double trucks from the McGuire-Cummings Manufacturing Company, Chicago, Ill.

Capital Traction Company, Washington, D. C., has recently placed an order for 20 Westinghouse two-motor equipments and 20 equipments of double-end, K-27 control.

Connecticut Company, New Haven, Conn., has ordered two standard steel underframe long-broom sweepers from the McGuire-Cummings Manufacturing Company, Chicago, Ill.

Cleveland (Ohio) Railway has placed an order with the McGuire-Cummings Manufacturing Company, Chicago, Ill., for two of that company's standard steel underframe long-broom sweepers.

Nebraska Traction & Power Company, Omaha, Neb., has not yet contracted for the cars for which it was reported to be in the market in the *ELECTRIC RAILWAY JOURNAL* of June 4, 1910.

Chillicothe Electric Railroad, Light & Power Company, Chillicothe, Ohio, has placed an order with the G. C. Kuhlman Car Company, Cleveland, Ohio, for a long-broom snow sweeper, to be delivered by Oct. 15, 1910.

Lexington & Interurban Railways, Lexington, Ky., have placed an order with the McGuire-Cummings Manufacturing Company, Chicago, Ill., for one of that company's standard steel underframe, long-broom sweepers.

Grand Valley Railway, Brantford, Ont., which was reported in the *ELECTRIC RAILWAY JOURNAL* of Feb. 19, 1910, to be in the market for equipment, will purchase eight single-truck city cars, two double-truck city cars and a single-truck snow sweeper.

United Railroads, San Francisco, Cal., have awarded the Jewett Car Company, Newark, Ohio, the order for the 80 pay-as-you-enter cars for which it was reported in the *ELECTRIC RAILWAY JOURNAL* of Aug. 6, 1910, to have issued specifications through Ford, Bacon & Davis, New York, N. Y.

Fort Dodge, Des Moines & Southern Railroad, Fort Dodge, Ia., reported in the *ELECTRIC RAILWAY JOURNAL* of May 21, 1910, to have under consideration the purchase of additional heavy electric freight locomotives, has ordered two Baldwin-Westinghouse electric locomotives, each equipped with four 125-hp Westinghouse commutating pole motors.

Mahoning & Shenango Railway & Light Company, New Castle, Pa., reported in the *ELECTRIC RAILWAY JOURNAL* of Aug. 20, 1910, to have ordered 12 city cars from the Niles Car & Manufacturing Company, has specified the following details for these cars:

Seating capacity.....	48	Brakes	Ackley
Weight,	16,500 lb.	Couplers	Niles
Wheel base	5 ft.	Curtain material...	Pantasote
Length of body, 30 ft. 10 3/8 in.		Gongs	pneumatic
Over vestibule....	4 ft. 1 5/8 in.	Heaters	Consolidated
Length over all....	42 ft. 3 5/8 in.	Sanders	O. B.
Width over all....	8 ft. 1 3/4 in.	Seats,	
Height sill to trolley base,		longitudinal rattan spring	
		• 9 ft. 7/8 in.	Trucks, type and make,
Body	wood		Stand, O-50
Underframe	composite	Signs	Hunter
Air brakes	Nat'l		

TRADE NOTES

American Concrete & Steel Railroad Tie Company, St. Louis, Mo., will build a plant in St. Louis for the manufacture of concrete railway ties. The plant is designed to turn out 2,000 ties daily.

Perry Ventilator Corporation, New Bedford, Mass., has received the order for equipping with its ventilators the 50 cars now being built for the Pittsburgh (Pa.) Railways at the works of the Standard Steel Car Company at Butler, Pa.

Improved Block Railway Signal System, Hammond, Ind., has been incorporated with a capital stock of \$50,000 to promote the company's improved block railway signal system. The directors of the company are, Charles D. Anderson, Howard Rose and C. S. Beneppe.

Schroeder Manufacturing Company, Newark, N. J., has been incorporated to conduct a mechanical and electrical engineering business. It is capitalized at \$200,000, and the incorporators are: John E. Heim, Arthur A. Schroeder, Hugo Beopple, Jr., all of Newark, N. J.

H. M. Byllesby & Company, Chicago, Ill., have purchased the Sapulpa Electric Company, which operates the central station business at Sapulpa, Okla., and will hereafter operate and manage the property. Byllesby & Company will install a 500-kw generating unit, which will more than double the capacity at the station.

Electrical Utilities Corporation, New York, N. Y., has been incorporated to do a general contracting business and electrical work of all kinds. It is capitalized at \$10,000, and the incorporators are: Nathan Cohen, 27 West Twenty-seventh Street, New York, N. Y.; G. Cohen, 269 West 153d Street, New York, N. Y., and Norman S. Risenfeld, 141 Broadway, New York, N. Y.

Northwestern Electric Equipment Company, New York, N. Y., which will do electrical work of all kinds, act as electrical engineers and deal in dynamos, motors, etc., has filed articles of incorporation. It has an authorized capital stock of \$10,000, and the incorporators are: Charles I. Taylor, Frank H. Parcells and Robert G. Redlefsen, all of 54 Wall Street, New York, N. Y.

Edison Storage Battery Company, New York, N. Y.—W. W. Wheatly, who recently resigned as general manager of the Kansas City Railway & Light Company, Kansas City, Mo., has taken the western representation of the Edison Storage Battery Company and the Edison-Beach storage battery car. Mr. Wheatly has taken headquarters in the McCormick Building, 193 Michigan Avenue, Chicago, Ill., and will represent these companies in all the territory west of the Mississippi River, and also in Michigan, Indiana, Illinois, Wisconsin and Minnesota. He is enthusiastic over the future of storage battery car operation with the new Edison battery.

ADVERTISING LITERATURE

Pay-as-You-Enter Car Corporation, New York, N. Y., has issued a 12-page folder in which several types of pay-as-you-enter cars are described and illustrated. The text is printed in English, French, Spanish and German.

Albert & J. M. Anderson Manufacturing Company, Boston, Mass., has issued a series of illustrated blotters, calling attention to its double-beam section insulators, elephant strain insulators, Anderson trolley wheels and Anderson wood strain insulators.

Westinghouse, Church, Kerr & Company, New York, N. Y., have issued a 62-page booklet in which the work done by the company in connection with the New York passenger terminal and the improvements of the Pennsylvania Railroad and the Long Island Railroad is described and illustrated.

Triumph Electric Company, Cincinnati, Ohio, has issued Bulletins Nos. 391 and 411. Bulletin 391 is entitled "Direct Current, Steel Frame Motors, Type F" and supersedes Bulletins Nos. 271 and 311. Bulletin No. 411 is entitled "Small Direct-Connected Generating Sets," and supersedes Bulletin No. 291. The company also calls attention in a circular printed on one side only to its small generating sets for private lighting.

Heath & Milligan Manufacturing Company, Chicago, Ill.,

in *Co-Operation and Expansion* for September, 1910, call attention to the closing, on Oct. 1, 1910, of the contest started on Jan. 1, 1910, to determine the 50 representatives from each State and territory who have made the best showing in sales since the contest was begun. The publication contains several articles of importance to those interested in paints and painting, and also contains an announcement of an increase in the price of Heath & Milligan paints of 20 cents per gallon, with the reasons for the increase.

Underfeed Stoker Company of America, Chicago, Ill., in the August issue of *Publicity Magazine*, which is No. 4 of Vol. IX, publishes a list of recent sales of Jones underfeed stokers aggregating 26,200 boiler hp. Among the railway orders was one from the Toledo, Port Clinton & Lakeside Railway for 1600 hp, Georgia Railway & Electric Company, sixth order, for 1800 hp and Toledo Railways & Light Company, second order, for 800 hp. The latter company began its experiments with this type of stoker by buying stokers from plants which were being dismantled. It now has in service Jones stokers supplying boilers aggregating 2200 hp.

Barrett Manufacturing Company, New York, N. Y., has issued a publication entitled "The Great Pennsylvania Terminal—What Keeps It Dry? A Correction," prompted by the previous publication of the company, entitled "What the Pennsylvania Railroad Thinks of Coal Tar Pitch and Felt," in which the statement was made that "a new and costly kind of waterproofing material was tried in the first section as a substitute for coal tar pitch." The Barrett Company says that the engineer in charge states that the decision regarding the materials was reached in advance of actual construction and was not the result of experiments after the work was started. The following is published as a correction: "Before construction was commenced, a careful study and investigation was made by the chemists of the Pennsylvania Tunnel & Terminal Company of many waterproofing compounds, with the result that it was decided to use coal tar pitch instead of asphalt as a binder between layers of felt, and this decision was not changed during the entire work."

Mead-Morrison Manufacturing Company, Cambridge, Mass., has issued a very handsome album containing views of some of the more important installations of its coal and ash conveyors. The volume is standard size, 9 in. x 12 in., is substantially bound in cloth and is termed "Catalogue 16." The engravings are for the most part interiors of power stations, and are remarkably good, considering the disadvantageous circumstances with regard to the absence of light under which most of them must have been taken. Among them are views of the Interborough and Manhattan power stations in New York city, and stations in Denver, Dubuque, Minneapolis, Louisville, Omaha, London, Kansas City, St. Louis, Washington, Anderson, Cleveland, Brooklyn and Chicago. The illustrations show the wide variety of types of conveyors and methods of their application and thus indicate the adaptability of this type of conveyors to various services and locations. In all of the plants described there are over 28 miles of McCaslin conveyors, or 112 miles of conveyor chains. A feature of the book is that all of the photographs are recent and practically the entire book has been compiled and printed during the present calendar year, so that it is up to date.

In commenting on the affairs of the Coney Island & Brooklyn Railroad, S. W. Huff, president of the company, is reported to have said: "We are spending all of our surplus cash on our property. In some ways the past year has been a good one for us and in others it has not been so good. But we are fast getting on our feet. We expect to hear of a court decision in the Coney Island parkway suits next month, and are now proceeding slowly in our repairs to the Franklin Avenue line. The Public Service Commission of the First District allowed us a bond issue for Coney Island Avenue, but said that we would have to fix up Franklin Avenue largely out of our earnings. Naturally these improvements cannot be made as fast under existing circumstances as they could have been had our application for a bond issue been favorably acted upon."