

Electric Railway Journal

Vol. XLI

NEW YORK, SATURDAY, FEBRUARY 15, 1913

No. 7

PUBLISHED WEEKLY BY

McGraw Publishing Company, Inc.

JAMES H. MCGRAW, President. C. E. WHITTLESEY, Secretary and Treas.
239 West 39th Street, New York.

CHICAGO OFFICE.....1570 Old Colony Building
PHILADELPHIA OFFICE.....Real Estate Trust Building
EUROPEAN OFFICE....Hastings House, Norfolk St., Strand, London, Eng.

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, 8000 copies are printed.

OPERATION OF A UNION BENEFIT PLAN

In the current issue of the *Motorman and Conductor* is given a report of the operation in 1912 of the death and disability benefit plan inaugurated in 1911 by the Amalgamated Association of Street and Electric Railway Employees. This is, therefore, the first complete year's experience with a system which promises benefits based on the length of membership in the association and varying from a minimum of \$100 to a maximum of \$800. The total amount paid out during the year to 247 beneficiaries was \$114,950, which is perilously close to the income depended upon to carry the benefit scheme. This income, at the rate of \$3.12 per year (26 cents a month) from 37,000 members, amounted to \$115,440, leaving a margin of less than \$500 above the outgo. These figures hardly justify the confident statement made in presenting them that "they show an absolute assurance that the venture is secure from the remotest possibility of default." If the system has the effect its originators desire, namely, that of preventing members from dropping out of the union, this effect will just as surely show in larger benefits and fewer "non-beneficial deaths," which last year were 16.5 per cent of all the deaths that occurred among Amalgamated members.

PAY FOR RAILWAY MAIL SERVICE

A report of the hearing on railway mail pay before a committee of Congress, at which arguments for an increase in compensation were presented by a committee of the American Electric Railway Association, is published in this issue. It is of special importance because the request of the committee was presented directly to a committee on which members of both houses of Congress are represented, and because the arguments were supported by data showing the losses to individual companies under the prevailing rates. As the amounts appropriated for railway mail service are determined by Congress and the Post Office Department is not able, if it were willing to do so, to exceed

the sums or rates allowed, the committee has done some educational work which is a real service to the industry. The value of such analyses of accounts as were submitted to the committee lies not only in the opportunity for educational work with public authorities but also in the lessons they give to railway managers concerning the actual results of operations. It is true that the mail service is in the nature of a by-product of urban railway operation, but it is not true that it is a by-product in the same sense in which that term is applied in industrial enterprises. It is said that the Chicago packers can afford to conduct the business of slaughtering animals and marketing meats for little or no margin of profit because the profits from by-products are compensation enough for the risk and investment, but the electric railway industry generally in its present state needs such profits as it gains from the regular business of carrying passengers as well as from all of the by-product sources of revenue that are developed. More than one railway manager is deluding himself with the theory that some service which is of the by-product type is furnishing a profit to the company when an analysis like the one made by Mr. Neal of Boston would show that he is actually providing it at a loss.

THE CO-OPERATIVE STORE MOVEMENT

The co-operative store form of welfare work, which is being taken up by the Interborough Rapid Transit Company of New York, the Philadelphia Rapid Transit Company and The Milwaukee Electric Railway & Light Company is a practical means of aiding employees which is well worth a thorough, conscientious trial. Owing to the large proportion of trainmen who leave the service voluntarily or are discharged within a few months from the time of their employment, and to the resultant small proportion of long-service men, some of the customary forms of welfare work do not help the great body of employees. The promise of a pension in old age, for instance, does not appear to a young man in the same advantageous light as a saving in the daily or weekly grocer's bill which a well-managed co-operative store ought to show. Any opposition to a co-operative store movement that might arise from representatives of the men is clearly not in the interest of the men if the store offers goods at prices below those obtainable by the employees elsewhere, and if the store does not quote such prices there is every reason why it should be abolished. If opposition developed from merchants who found their business reduced because trainmen transferred their trade it would be an unfortunate circumstance, but it is, after all, the duty of the railway company to improve and strengthen its own organization and, if a co-operative store is a means to that end, it is amply justified. In the report presented at the recent annual meeting of the National Civic Federation in New York the welfare depart-

ment of that organization says that it "is not able to point to any co-operative plan in this country which has been a marked success," and adds that the plan does not seem to fit American customs as the great co-operative stores in England do in helping to meet the low-wage conditions there. The establishment of successful co-operative stores, therefore, will be an accomplishment of no small dimensions. If the electric railways are able to carry into effect what they are considering, they will reduce the cost of living for every employee and his family in such a way that the benefits will be plain from day to day.

PLANNING SHOP PRODUCTION

The pursuit of higher efficiency in the mechanical department of a modern street railway system depends for success upon many factors, but of these none is of greater importance than intelligent planning of work to be handled on a broad scale. In a typical instance 500 trucks were to be overhauled during one season of 120 working days. The magnitude of the task justified the careful preliminary study of methods of working, order of processes and disposition of men and materials, and the success of the program was unquestionably due in large manner to the systematic anticipation of every emergency. The capacity of the shops was limited, although no restriction was placed upon the number of necessary workmen who could be put upon the truck job. The general scheme adopted was to allow only two types of trucks to come into the shop during a given period. Two or three weeks in advance of the appearance of each type of truck, the shop notified the foremen of carhouses in various localities on the system as to the number and type of trucks required thus far ahead of the shopping date, so that the carhouse foremen had ample time to have the desired trucks ready for movement to the shop in due season.

The passing of trucks through the shop was also planned on the basis of a regular schedule. The general order was followed of running the truck into the building upon a single track, having it knocked down by two men who performed no other service and remained in a fixed position, and the subsequent movement to other departments of the trucks, which were handled by workmen in twos who specialized in every instance in one class of operations. Each truck passed six pairs of workmen on its way through the shop without doubling in its course, and in all cases the successive pairs remained in place, the work being passed from position to position in straightforward fashion. The success of the scheme depended, of course, upon trucks being in the shop yard in specified quantities and at stated times. Thus, a schedule of fifteen trucks per week of a certain type demanded an actual delivery of three trucks per day and not an average of three per day for the period. In this way not a moment was lost in securing a new truck to knock down, and the equipment moved uniformly through the shop from crew to crew. By putting the trucks through in this way it was found that they could be handled at less cost than on any other basis, for the reason that expenses are reduced when workmen have materials and tools on hand and work ahead to keep their full time occupied in specialized activity. Other advantages were a reduc-

tion in fatigue due to specialization and a continuous supply of work, since lost motion in starting and stopping jobs was practically eliminated. Of course, the treatment of this problem was along well-known lines of industrial production, but in some railway shops the irregularities of the demands upon the force and equipment have tended to obscure the possibilities of such careful planning.

POWER CONTRACT FOR A TRUNK-LINE ELECTRIFICATION

We publish this week a brief account of the very interesting contract entered into between the Great Falls Power Company and the Chicago, Milwaukee & Puget Sound Railway for the electrification of part of the latter system. This contract has been more or less in the public eye on account of the difficulties of making suitable arrangements with the federal government for crossing the public domain. This difficulty having been settled, the contracting parties were free to go ahead, as the agreement with the government has insured a fifty-year right-of-way. The contract goes to a final possible limit of no less than 25,000 kw, with various options for lesser amounts.

The interesting features of the contract have to do chiefly with the provision for suitable delivery of the power and the price therefor. The railway company will receive the energy purchased on the high-tension line at either 50,000 volts or 100,000 volts, three-phase, 60 cycles, and will make its own provision for the transformation of the energy into such form as it may desire. The supply company, therefore, merely has to deliver its high-tension current and consider nothing further regarding its distribution or further uses. The energy delivered will be measured by watt-hour meters and curve-drawing wattmeters, and it is specified in particular that the railway substations must contain sufficient synchronous machinery to give a power factor of at least 80 per cent leading or lagging. To insure the carrying out of this provision the power company has the right to install automatic regulators on such synchronous machinery so as to hold the power factor at any point it may desire between the limits of power factor just noted. In other words, although the power is purchased on the high-tension circuits and transformed and distributed wholly by the purchaser, the power company yet reserves the right to control the power factor within a range of 20 per cent either way from unity. This is a somewhat unusual but very wise provision, considering the purposes for which the energy is sold.

The rate at which this energy is purchased is on its face extraordinarily low, amounting to 5.36 mills per kw-hr. only. This is probably much the lowest figure at which a large block of power has ever been sold at the end of a high-tension transmission line. What few cases of lower figures there are have been for relatively small quantities and under extraordinary conditions. It is a most striking comment on the condition of electrical power transmission when it is possible to make presumably at reasonable profit so low a figure as this. A saving clause, from the standpoint of the supply company, is that the minimum bill is put at 60 per cent of the energy contracted for. This means that the railway company in order to secure its whole sup-

ply of power at the rate just quoted must take very good care of its operating conditions; else, owing to the minimum-bill provision, the cost per kilowatt-hour of power actually delivered might run materially above the basic price of the contract. It would not be at all surprising if it did thus run high in the actual working out of the scheme of electrification. It is absolutely certain that the railway company could not generate its own power at anywhere near the price quoted, which assuredly is a feature of much encouragement toward electrification projects in general aside from the fact that the steam railroad's investment for electrification is materially reduced in any event.

AN EXAMPLE OF GOOD PUBLICITY

At the midyear meeting of the American Electric Railway Association there was renewed discussion of publicity, without which no gathering of electric railway men would be complete. True, there was not a great deal of publicity in evidence, but there was much talk about it, just as there has been before and will continue to be until publicity becomes a fact instead of something that is merely approved of but not accomplished.

In the meantime we see here and there examples of sporadic publicity which are the best evidence of what can be done in the way of educating the public into the intricacies, difficulties, possibilities and accomplishments of electric railroading. In New York there has been of late considerable criticism of surface railway service. This service has been better than usual; the criticisms were merely a familiar symptom of the newspaper mania which is periodically manifested in a desire to "make it hot for the railway company." But this time the railway company has answered back.

In our issue of Dec. 7, 1912, there was printed one of the statements issued by the New York Railways Company, dealing with various subjects of public complaint. Another statement, over the signature of Frank Hedley, vice-president and general manager of the company, appears in the *New York Sun* of Feb. 9. It is admirable in tone and substance. Prefaced by the statement that "it is apparent that many factors in the situation which are so thoroughly well known to railroad men as to seem trite and commonplace are not altogether understood by the general public," Mr. Hedley proceeds to give some details of the difficulties of surface operation in New York streets that can hardly fail to make the reader wonder that the service is as good as it really is.

He shows, for example, that the five-minute delays caused by track obstruction amounted in six months to 37,295 minutes, or 621 hours. He explains how cars become bunched by hold-ups at heavily traveled crossings where the traffic policeman's word is a higher law than railway schedules. He gives a count that was made of the 130,000 pedestrians and the 7000 vehicles, besides the cars, that cross Thirty-fourth Street at Broadway and Sixth Avenue every twelve hours. The work of the street inspectors and emergency department in keeping cars moving and of the tally men in supplying data for readjustment of schedules is described in a way that must convince reasonable men that the railway is trying, and trying hard and intelligently, to give good

service. Just as important is the proof this article affords that, try as it may, there are certain inevitable inconveniences connected with operation on crowded city streets, and that it is foolish to blame the company for these unavoidable inconveniences.

This is good publicity. Kickers we shall always have with us, but they will grow fewer in the degree that railways make their problems, and what is being done to solve them, understood. This applies to larger problems as well as to those every-day annoyances that make so many enemies. And with the annoyances or inconveniences explained or accounted for there are always fewer enemies and less hostility to overcome when the larger problems of rates, financing and franchises come up before public bodies for their adjudication.

TRANSPORTATION AT THE PANAMA EXPOSITION

In discussing the New York subway muddle, in which politics seems to be as large a factor as ever, we took occasion to refer to the difficulties which a company or an individual is likely to encounter in carrying on any public work when business must be done with a municipality. A similar condition exists in San Francisco, and the causes seem largely the same, namely, the desire of some politicians to pose as the champions of the people by opposing any grant to build railway extensions except on prohibitive terms. But the conditions in the two cities are somewhat different because in San Francisco the need for definite action is accentuated by the near approach of the international exposition and the grounds selected for this event are almost without any transportation facilities from the city, certainly without any which would be at all adequate for the demands to be made upon them. Nevertheless, the city is unwilling to allow any extensions to be built by the local railway company except under a franchise revocable at any time. Upon such a permit the company has declared that it cannot borrow the money necessary to finance the enterprise.

It is possible to understand, now that the city has embarked upon a policy of municipal railway operation, why it might not like to grant a number of long-term franchises without some provision for their recapture at the end of a term of years. The company has recognized this condition and has offered to build under an indeterminate franchise by which the city could at any time obtain the property so built at its actual value. Some of the members of the Board of Supervisors approve this plan, while others think the city should force the company to build under the revocable-permit plan already mentioned. In the meantime the directors of the exposition are in despair over the likelihood that nothing will be done until it is too late to make adequate provision for transportation to and from the exposition grounds. The city took the proper step when it engaged an expert to report on the proposition. He recommended an arrangement with the company, but this advice was not palatable and was not adopted. Nevertheless, the time at which the fair is advertised to open will not wait while the municipal authorities back and fill, and unless some action is reached soon the exposition gates will have to be swung back for visitors before the connecting tracks can be properly built and placed in operation.

Illinois Traction System's St. Louis Express and Freight Traffic Methods

A Detailed Description of the Methods Employed in Stimulating and Handling a Large Express and Freight Business—The Article Also Describes Briefly the Terminal Facilities, Which Represent a Seven-Million-Dollar Investment

The acquisition and construction of terminal facilities involving an expenditure in excess of \$7,000,000 by a steam railroad trunk line is not unusual, but for an electric railway system to undertake a project of this magnitude marks an epoch in the annals of this industry. Detailed descriptions of these different facilities—namely, the Venice power house, the McKinley Bridge, the St. Louis express terminal and others—were published from time to time in the *ELECTRIC RAILWAY JOURNAL* as the work progressed. The purpose of this article is to describe briefly these terminal facilities in relation one to the other, and to give a detailed

ever, negotiations were entered into whereby a building was leased and remodeled in East St. Louis for freight traffic purposes.

This traffic developed very rapidly owing to energetic solicitation on the part of the traffic department until it was evident that maximum development lay only in a terminal station in St. Louis proper. At that time the East St. Louis merchants delivered their own shipments to the freight house, but St. Louis shippers had to depend upon a large transfer company with which the traction system had made a contract to reach the freight house. Team



St. Louis Freight Terminal—View Showing Entrance to Freight House Tracks and Milk Platform

account of the methods employed in stimulating and handling particularly the express and freight traffic wherein lies the financial success of a project of this size.

HISTORICAL FEATURES

The existing lines of the Illinois Traction System now total 460 miles. This system began in a modest way in 1901 with a 6-mile line built from Danville, Ill., to a mining suburb. Since that time extensions to the property have been made from year to year. These at the close of 1911 averaged 50 miles annually. In 1906, when the line between Springfield and St. Louis had been constructed as far south as Granite City, a suburban place on the Illinois side of the Mississippi River about 6 miles north of the St. Louis business district, considerable difficulty was experienced in obtaining an entrance into St. Louis. After negotiations were conducted for some time with the East St. Louis & Suburban Railway interests, a trackage agreement was reached whereby the Illinois Traction System could run its passenger trains to the east end of the Eads Bridge. At that time very little attention was paid to the general freight business, and it was confined almost wholly to less-than-carload traffic. After a short time, how-

traffic across the Eads Bridge was extremely congested, and the grades in the approaches limited the truck tonnage. The additional expenses necessary to obtain business in this way as well as the serious delays experienced in team delivery did more than any other thing to bring about the present arrangement.

ACQUISITION OF ST. LOUIS TERMINALS

There were many obstacles in the way of obtaining desirable freight and passenger terminals in a strategic location in St. Louis. First, the cities of Granite City, Madison and Venice, which lay on the only available route to the proposed McKinley Bridge site, were large manufacturing districts, covered with a network of steam road industrial tracks. It was necessary to cross these, as well as a number of trunk lines leading to the approach of the Merchants' Bridge, which crosses the Mississippi River about three-quarters of a mile up the river from the site selected for the McKinley Bridge. The same difficulties had to be met on the St. Louis, or west, side of the Mississippi River as on the east. Here the approaches to the bridge cross several steam road main lines. Each of these roads raised every possible obstacle in the way of the traction company,

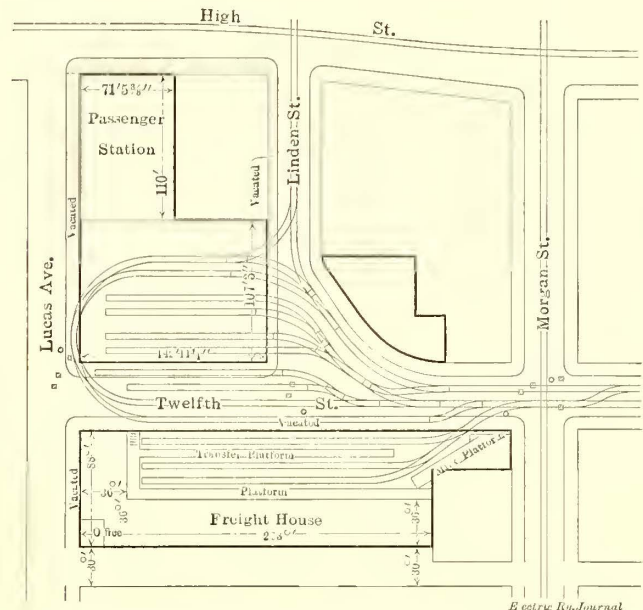
as all believed it would infringe upon the prosperity of the St. Louis Terminal Association, of which they were members.

On the St. Louis side the objective point for terminal facilities was selected in a tentative way somewhere near Washington Avenue between Twelfth Street and the river. Very little difficulty was experienced with the St. Louis City Council in obtaining a street railway franchise, as the public was up in arms against the terminal association. This association had arbitrarily fixed rates across the river which made all commodities coming from the east higher in price in St. Louis than on the Illinois side of the river. These franchise rights were obtained over a portion of Ninth Street and Twelfth Street as far south as Lucas Avenue. As these streets were very narrow, it was necessary to purchase additional property at angles in the street in order to allow clearance between cars on the double track, as well as between the buildings and the cars, and at the same time reduce the curvature. One and one-half city blocks, lying just north of Washington Avenue, the principal retail street of St. Louis, and between High Street and Eleventh Street, were purchased for a freight and express terminal as well as a passenger station. In addition to these, a portion of the property under the bridge approach near Broadway and Salisbury Street was utilized as an additional passenger station, and a strip of land, 600 ft. in width by 1400 ft. in length, extending back from the banks of the Mississippi River was purchased for the bridge approach as well as for a location for steam tracks and for freight-car storage purposes.

Under the franchise agreement with the city of St. Louis trains are restricted to a single trail car and motor car during the day and two trail cars and a motor car during the night time. This agreement prohibits ordinary steam road freight cars to use the streets, thus making it necessary to load and unload this class of equipment in the yard under the St. Louis bridge approach. Recent interchange contracts made with several steam roads have given the electric line access to receipts and deliveries of freight from twenty-eight steam road connections. It now has friendly relations with all steam roads entering St. Louis and has become a member of the American Railway Association. These friendly relations have also served to en-

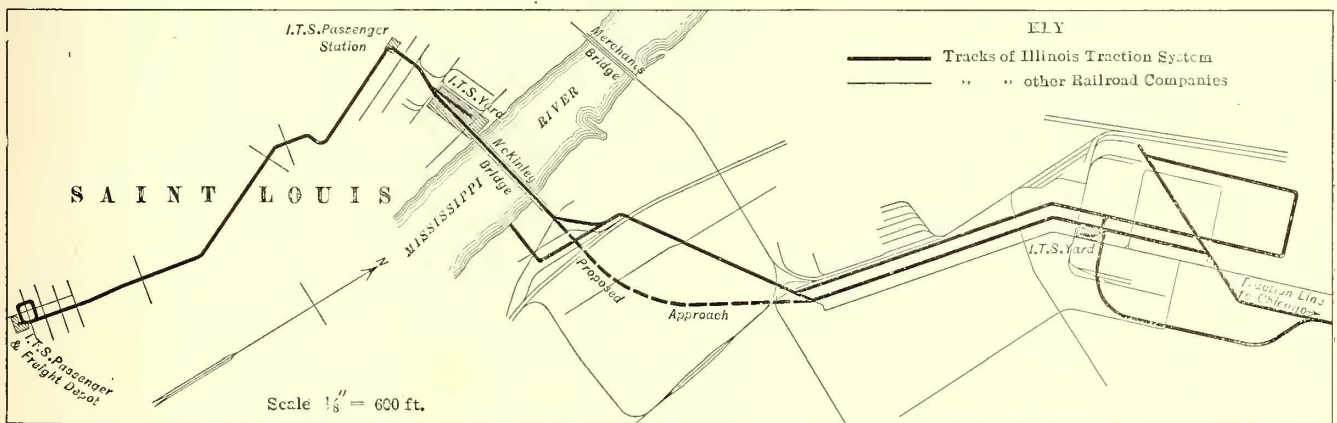
sary to break up the trains and haul them over one or two cars at a time to the St. Louis express terminal between the regular passenger cars operating under this close headway.

Under the existing arrangement of operation the line crews do not cross the river but set out their train on a side track in Venice at the east end of the bridge. As these express trains arrive at a time when they are per-



St. Louis Freight Terminal—General Plan of Main Terminal

mitted to haul two trail cars into the St. Louis terminal, the express motor and two cars are detached and proceed into the city. Several passenger car motors are held over at all times at the St. Louis terminal and are employed with extra crews in charge to pull the remainder of the two express trains into St. Louis, one car at a time. At the present time these two express trains include fifteen cars, seven in one train and eight in the other. Although considerable time is consumed in setting the incoming train in



St. Louis Freight Terminal—Map Showing Route of Illinois Traction Tracks Into St. Louis

able it to show an enormous growth in the gross tonnage handled annually in and out of St. Louis.

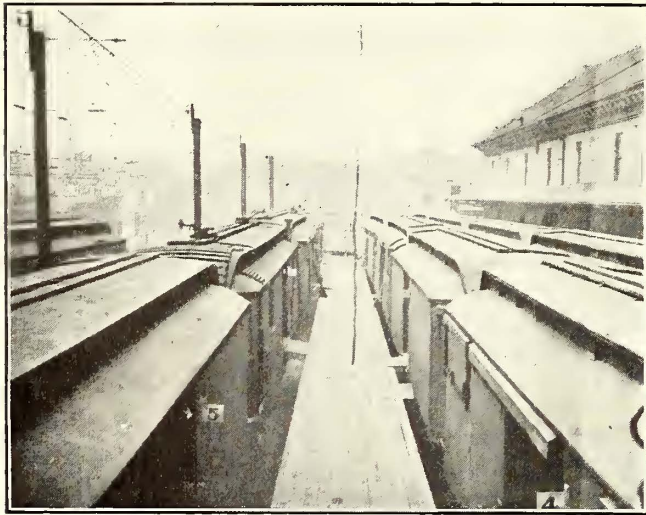
TERMINAL OPERATION

At the present time there are sixteen local and limited trains running into St. Louis and the same number out each day. A ten-minute headway also is maintained throughout the day on the street railway line operating between St. Louis and Granite City. In addition to these, sleeping-car and parlor-car service is operated between St. Louis, Springfield and Peoria. The arrival and departure of freight and express trains is such as to make it neces-

sary to break up the trains and haul them over one or two cars at a time to the St. Louis express terminal between the regular passenger cars operating under this close headway.

The reverse movement of these express trains is in a similar way, except that the trains are made up by two electric switch engines on a third track on the St. Louis side of the McKinley Bridge approach. These two engines not only do this work but are used for switch service between Granite City and St. Louis. This switching includes setting back freight cars into the freight yard under the west bridge approach, setting coal cars to the retail coal-handling plant on the same side of the river and clearing

the freight yard of bulk freight loads, either setting them to the steam road connections or making up freight trains in Granite City for the north. The average number of cars on each night's shipping list approximates 120, including a large number of interline cars to and from connections. All interurban train movements are under the general supervision of a terminal trainmaster. His jurisdiction



St. Louis Freight Terminal—Transfer Platform and Numbers on Cars

not only extends over movements in St. Louis but on the east side of the river as far north as the Granite City belt line.

ST. LOUIS TRAFFIC DEPARTMENT ORGANIZATION

The general agent whose authority extends over the Illinois Traction System's lines south of Springfield has charge of all freight and express traffic matters at the St. Louis terminal. Reporting to him are the city passenger agent, the local agent and the commercial agent. The duties of the city passenger agent include the stimulating of the passenger traffic. He keeps in personal touch with the different clubs, societies and social organizations so that he will be advised in advance of unusual passenger traffic movements. By keeping informed as to movements of various theatrical troupes he is enabled to procure a large portion of this business along the Illinois Traction lines. A commutation fare book permits the passenger traffic agent to give attractive rates to large or small parties, firms, families or individuals. The book may be used individually or collectively at $1\frac{1}{2}$ cents per mile, which has made it very popular.

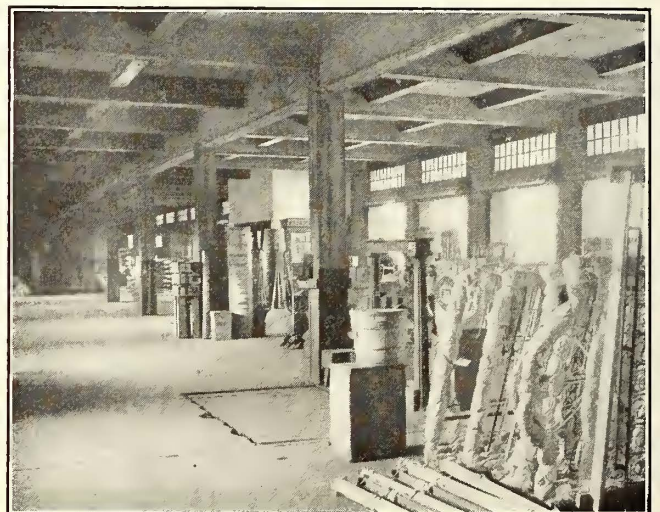
During the winter months, when there is very little excursion business to be had, the passenger traffic agent consumes a large portion of his time booking dates for summer excursion business. By having advance notice of this extraordinary passenger traffic movement he is able to co-operate with the various societies and organizations so that in setting the dates the best service may be given. By dating this excursion business consistently throughout the summer months he is able to regulate the total passenger traffic so as not to overtax the available rolling stock.

To the commercial agent is assigned the duty of stimulating freight traffic, and two contracting freight and express agents report to him as assistants in this work. The senior of these two contracting agents solicits freight along the line between St. Louis and Springfield. He watches the conduct of the business at the different stations and submits his criticisms to the commercial agent, who in turn passes them on to the general agent. As the traffic department does not have supervision over the way station agents, these criticisms are passed on to the division superintendent, who has direct charge.

The junior contract agent is assigned to St. Louis. From time to time he makes a house-to-house canvass for business, but the greatest results come from the personal friends he is able to make on these trips of solicitation. There was a time when these agents could bid for traffic against competing roads by reducing rates, but it is different now. The Illinois Traction System is under the supervision of the Interstate Commerce Commission and its rates are the same as those of steam roads. The agents' talking point nowadays is service, and the electric line is in a position to offer express deliveries at freight rates. The wide range of territory covered by this single line in the State of Illinois is of great assistance in getting business. If the electric line can establish its reliability with the shipper, he would rather deal with a single road than with several in order to reach a number of given points.

Another source of information which has resulted in a large volume of business gained by solicitation is through construction items appearing in the daily newspapers. All the papers published in the cities and villages touched by the traction line are watched very carefully for this kind of news. When advice is obtained that a large building is to be built at a certain point the contracting freight agent follows this lead until the contract for the building is let. Having previously gained a knowledge of the large builders' supply houses along the traction line, he is able to interest the contractor in his own shippers, or if material has been purchased at points from which the traction line could get a portion of the haul, the agent then has quick-delivery service to offer.

The receipts and deliveries of all St. Louis freight and express are under the supervision of a local agent. His office is located at one end of the express terminal building, where he may easily observe the conduct of the business. The office force includes a cashier, two bill clerks, a stenographer and a yard clerk. The force required to handle the freight through the warehouse includes a warehouse foreman, two checkers, two loading clerks and three gangs of truckers with three men in each gang. In addition to these a delivery clerk sees that shipments are properly receipted for by the consignee and stevedore, whose duties include stowing the freight in the cars. An outside



St. Louis Freight Terminal—Portion of Interior of Freight House

collector also is provided to assist the cashier in keeping up his collections.

METHOD OF RECEIVING AND CHECKING INBOUND FREIGHT AND EXPRESS

The freight house tracks are arranged so that twelve cars may be set for loading or unloading at one time. There are three tracks, each of which will hold four cars. Two of

these tracks are on 11-ft. centers and the third is 18 ft. distant between track centers. This latter spacing allows what is known as a transfer platform to be built between them. The purpose of this platform is to allow truckers to reach cars on the outside track without passing through those set on the two inside tracks.

As noted earlier in the article, the inbound express train arrives early in the morning, and all cars are sent to the house before 12 o'clock noon. The warehouse doors are open from eight in the morning until five in the evening for the receipt and delivery of shipments. When the warehouse force arrives in the morning most of the inbound express and freight cars have been set. The unloading clerks with their gangs of three truckers each are assigned to certain cars. The method of checking inbound freight is by a blind tally of contents of each car. In making this check it becomes the duty of the clerk to inspect each box or package to obtain a description of the contents which he records on the tally sheet.

A certain portion of the warehouse floor is assigned to inbound freight, so that if the consignee does not call for his shipment promptly it will not interfere with the receipt of outbound freight. In order that the teaming on the driveway side of the building may be orderly, the local freight agent requires teams to approach the building from one end and leave at another. He bears this arrangement in mind in selecting a location for inbound freight, placing it at the end of the warehouse where the wagons leave.

When all the freight has been unloaded from a car the blind tally sheet is turned over to the warehouse foreman, who checks it against the waybill. All items checking on both are circled, and in case they do not correspond the exception is noted on both the tally sheet and the waybill, being "over" on one and "short" on the other. After assuring himself that the over or short shipment has not been missed by the unloading clerk, the warehouse foreman attaches the tally sheet to the waybills and turns them in to the local freight agent's office.

Upon the waybill's receipt in the agent's office the rate clerk checks the rates shown on the waybill, making corrections as necessary, and passes it on to the expense bill clerk. It is the latter's duty to prepare an expense bill in



St. Louis Freight Terminal—View of Team Side of Freight House

triplicate for each shipment appearing on the waybill. In addition to preparing the expense bill the expense clerk addresses a postal card to each shipper advising him of the arrival and giving a description of the shipment.

In case a shipment has been incorrectly expensed or the waybill shows an over or short shipment, a statement of expense corrections is issued in triplicate. Two copies

of the statement are mailed to the billing agent, who corrects his record, accepts the correction and sends one copy to the auditor for his information. The auditor, in turn, adds to or deducts from the St. Louis agent's account by debit or credit letter. When all the statements required by the condition of the waybill have been properly filled out, the expense bill is given to the cashier.



St. Louis Freight Terminal—View Showing Cars and Protecting Awning

Where bills for certain shipments are lost in transit the agent receiving the stray freight issues a waybill for stray shipments. This waybill is used for less than carload shipments, and if the agent receiving the stray shipment cannot locate the waybill showing the weight and charges, he must ascertain the shipping point from the invoice or bill of lading and collect all charges due.

If a truck driver calls for a certain firm's shipments and they have been received, he is referred to the cashier's office. Here the driver receipts the warehouse receipt and the cashier's stub if he pays the freight or the firm is on the company's credit list. Upon receipt of the warehouse receipt from the driver the warehouse foreman permits him to remove the shipment.

When a waybill shows an over, short or damaged shipment it is forwarded to the traction company's claim department as soon as the expense bills and other statements have been completed. If a shipment remains unclaimed or is refused and the local agent is unable to make delivery within thirty days from the date of receipt, an O. S. & D. report is issued. This report is made in triplicate, one copy going to the billing agent and one to the freight claim agent, and the third copy is retained for the local agent's record. A copy of each statement pertaining to a certain waybill is attached to it so that in case further investigation is desired a complete record may be had when the waybill is found. In addition to this record, which goes to the freight claim agent, a tissue record is taken of all statements as well as the postal card notice of freight received for the local agent's office record.

In accounting for all waybill dispositions, the local agent fills out other forms once in each month, one of which is an abstract of the local waybills received, another for local waybills forwarded and a third and fourth for abstracts of interline waybills received and forwarded. Each of these forms contains a record of the transactions only between two stations.

OUTBOUND FREIGHT

The method of receiving and handling outbound freight is of particular interest because it makes up a large proportion of the tonnage handled at the St. Louis express terminal and, therefore, largely controls the cost of handling freight through the warehouse. One of the strict rules of the warehouse foreman is that all outbound freight

must be deposited on the floor with the destination marking on each shipment in plain view. After unloading his freight in the warehouse in this manner, the teamster presents his shipping bill to the receiving clerk, who checks the shipments against it. If all items correspond, the dray ticket is stamped with the local agent's signature. If the shipment is billed to a prepay station and the shipper is not on the Traction Company's credit list, the teamster is referred to the cashier before the receiving clerk is permitted to accept the shipment.

In order to facilitate the loading of outbound freight, a box conveniently located and provided with seventeen pigeonholes, corresponding to the seventeen doors in the freight house, is employed as a point to deposit the receipted copy of the shipper's bill for shipments received at each door. This arrangement permits the loading clerk, who has supervision over three truckers, to take the bills, say, from pigeonhole No. 1, and he will find the freight corresponding to the bills on the warehouse floor at door No. 1. As he has been previously provided with a list showing the car number on which freight is to be loaded for certain destinations, he knows in what car each shipment is to be placed.

The cars are numbered arbitrarily by attaching a small rectangular piece of wood, which contains a number in large size printed on each side, beside the door of each car. In applying these numbers to the cars, however, it becomes the warehouse foreman's business to select the cars and apply the numbers in a way that will make switching unnecessary. Views showing the method of numbering cars as well as the transfer platform are shown in the illustrations.

Each loading clerk is provided with a small pad of blank paper, and each car has a pad of similar size, which is hung near the door and contains printed numbers corresponding to the arbitrary number placed on the car. After the trucker has loaded a shipment on his truck and the clerk has ascertained the destination of the shipment and is sure of its weight, he refers to his list of car numbers and obtains the number corresponding to the shipment's destination. He then marks this number on a blank slip of paper which he gives to the trucker. After the trucker has deposited the shipment in the car he pulls the slip of paper containing the car number from the pad at the door and returns with the two to the loading clerk. The introduction of these "very" tickets has served greatly to reduce the number of stray shipments and has assisted the traffic department in making prompt deliveries.

After all shipments which correspond to the tickets for a given door have been loaded the shipper's bills are placed in what is termed the office box. Bills found in this box indicate to the chief bill clerk that shipments have been received and loaded. He collects these bills from time to time and takes them to the local agent's office, where the shipments are classified, the rate is applied and the whole is recorded on the waybill going to the corresponding destination.

Each of the bill clerks has a list made by himself of all the local rates, and this list is mounted conveniently on his desk. When he bills shipments he glances at the rate sheet instead of consulting the printed tariff, a practice which greatly reduces the time necessary to do this work. Another apparently little thing which serves to shorten the time of making out waybills is that all are sorted in station order before he begins to classify them. After all waybills covering the day's outbound shipments have been completed a tissue press record is taken in duplicate, one copy going to the auditor's office. The dray tickets for the previous day's business are also filed for future reference. They are sorted in numerical order and filed in boxes containing 250 bills each. In case the receiving agent takes exception to a waybill, the St. Louis agent is able to locate the shipper's bill for verification in a short time.

The most valuable record to the traffic department in its efforts to reduce the cost of handling freight in less than carload lots is the station performance record. The record for each station is made out on a separate sheet. The record shows the date and number of each waybill, the initial and number of each car in which carloads of shipments are sent, a description of the freight, the weight of carload shipments and of L. C. L. shipments, the charges, advances, prepayments, claims, etc. This form is filled out at the first of each month covering the previous month's business and is a record of the efficiency of the organization at any given station. The average cost per ton for warehouse expense at the St. Louis express terminal has been between 25 and 30 cents. This cost depends largely upon the total volume of business handled each day, as it is necessary to maintain a warehouse force of sufficient size to handle the average daily shipments during any week. The office expense for this station averages about 15 cents per ton of freight handled during the month. The rapid increase in the total volume of business handled, however, has tended to reduce this fixed charge, and the amount shown is a fair average.

To give one a comprehensive idea of the large growth of freight and express business handled by the Illinois Traction System in and out of St. Louis since the establishment of the express terminal, it is necessary only to state that the less-than-carload lot business has increased more than 300 per cent since 1910. Until 1912 no carload-lot business was obtained from connecting steam lines. The following is a tabulated statement of the gross tonnage for a given month handled since 1910:

Year.	Month.	Total Tonnage.
1910	October	2,967,500 lb., L. C. L.
1911	October	3,800,000 lb., L. C. L.
1912	October	4,257,000 lb., L. C. L.
1912	October	5,311,000 lb., carload

During October, 1912, the carload freight received from and delivered to connecting steam roads at Venice, Ill., in which the traction company participated in the revenue, totaled 18,321,000 lb. This represents only that portion of the tonnage from foreign cars not delivered in St. Louis. The usual switching charge allowed by the Interstate Commerce Commission, when totaled for the month and added to the gross revenue, increases it materially.

Although this article is not intended to include the passenger traffic, some information relative to this class of traffic should be interesting. Agents are maintained at two points in St. Louis, one at the downtown station at Lucas Avenue and High Street and one in the sub-passenger station under the bridge approach at Broadway and Salisbury Street. The street railway service maintained across the McKinley Bridge has also shown a healthy increase since its inception, and a bridge toll is collected from vehicles and pedestrians. Although the toll for pedestrians is at a fixed rate, 5 cents each, that for vehicular traffic varies in proportion to the size of the vehicle.

TRAFFIC NOTES

The question of reducing claims for damaged freight and express has received considerable attention. The addition of a stevedore to the warehouse force has assisted materially in reaching this end. He is not only familiar with the method of loading cars which will reduce damage in transit to the minimum but is especially familiar with handling heavy glass shipments. Although the published tariff contains a rule for packing and crating, instructions have been issued to the receiving clerk to pay particular attention to the quality of the material used for this purpose. Crated furniture receives special attention as it has been the source of a large number of claims for damage in transit.

Another source of claims has been through the handling of perishable shipments. To eliminate this, the traffic department has made it a rule not to accept perishable commodities unless they are at the shipper's risk. As the

company has abandoned the use of refrigerator cars, shipments of fresh meat are not accepted from July to September. Shipments of vegetables are not accepted during the winter months unless the freight charges are guaranteed by the shipper and then they are accepted at his risk.

Damage in transit as well as over and short shipments has been greatly reduced by keeping a close check on the train crews and laying much stress on care in handling freight at the way stations.

Shortly after the traffic department had taken up quarters in the new St. Louis express terminal a dairy traffic agent was appointed. During the past three years this agent has developed a volume of milk business which adds materially to the revenue from freight and express business. He is a man familiar with stock raising and breeding who has specialized in the development of dairy products. Through circular letters he calls the farmers of certain communities together and organizes them so that their interests may be pooled. He advises them in regard to the raising of stock and chickens, and agrees to furnish them a market and to protect their interests. As a direct result of this, the company now runs a milk train consisting of two cars between Hillsboro and St. Louis, and the average daily shipments amount to 2500 gal. Four cooling stations have been established along the line, and the service is so scheduled that within four hours after milking the milk is in the St. Louis market.

The dairy traffic agent has been especially successful in protecting the farmer against the market. His knowledge of the worth of milk, sweet or sour, has served him in obtaining the maximum price for all kinds of milk. Heretofore the farmer has had to accept whatever the milk dealers offered. Now the milk which is not fresh is turned over to cheese factories, where it is as valuable as though it were sweet.

All passenger, freight and express traffic is under the general supervision of George W. Quackenbush, traffic manager, who reports direct to H. E. Chubbuck, vice-president executive.

TRAFFIC STATISTICS FROM BOSTON.

C. S. Sergeant, vice-president of the Boston Elevated Railway, presented at the A. E. R. A. midyear convention some statistics upon the investment, length of ride and revenue passengers per trip on the Boston Elevated Railway. In the abstract of the report of the meeting published in the Feb. 1 issue of this paper a few of these figures appeared, but the statement is such an interesting one that it is printed in full below:

"Realizing that the history of the business of electric railways has probably been as long in Boston as anywhere, I have brought along a few data going over a considerable period of years, showing what the results have been in the matter of possible revenue passengers for the half trip. The point I particularly wish to emphasize is the effect of the demands from the public in the way of extensions of lines, increased transfers, etc. In our case these demands have eaten up the advantages which are supposed to come from doing business for a long time in a growing community, as may be seen from these data from Boston, to which I would especially call attention. In 1888 some five or six horse railways were put together, forming a consolidated system, which gave the railway company virtually the monopoly of the business of the city. The operations of this consolidated company began substantially on Jan. 1, 1888. At that time it had a nice little business, and it took about nine thousand horses to carry it on. In the first year there were gross earnings of \$4,276,000 and the capital invested was about 2.72 times the amount of these gross earnings. The average number of revenue passengers for the half trip in that year was 22.5, the average length of the half trip was 3.62 miles and the average distance from

the center of the city to the ends of the routes was 4.79 miles. Following along from that time there was a constant tendency to extend to the more sparsely settled territory, and the lines afterward were extended, not only as to the trips that were run, but as to the total length of the routes. The company began also immediately to electrify the lines, so that in 1892 about half of the system was electrified and the number of revenue passengers per half trip had gone up from 22.5 to 28. Four years later, in 1896, the road was 98 per cent electrified, and there were 29.5 revenue passengers to the half trip.

"Now, without going over these figures, coming on later, we introduced the rapid-transit system, so-called—that is, the subways and the elevated—with a view to providing more room for the congested district, and with these lines the demands that were made for service cut down the average revenue passengers per half trip, so that these figures in 1903 went down to 23 and in 1912 were only 25.5. In other words, in 1912, with gross earnings of \$16,644,000, we had only three more revenue passengers to the half trip than we had with the horse cars in 1888.

"It seems to me, Mr. President, that these figures are rather significant; that what has happened to us is probably only typical of what will happen in many cities as business increases. Not only will there be more demands for transfers, more demands for extension in an unprofitable territory and more demands for new methods of carrying on the business, but in every way the public will take what would be the only increment of the capital invested, and it seems to me that that has some bearing on the question under discussion. The result in Boston has been that the permanent investment has increased to more than six times the gross revenue. Of that investment, which is now \$101,000,000, about \$16,500,000 has been contributed by the city, on which the railway company pays interest and sinking fund, so that a considerable part of the capital has been obtained at a fairly low rate. But even under these conditions it is extremely difficult to carry on the business and satisfactorily meet these increased public demands.

"I am heartily in sympathy with the report of our committee and the action of the executive committee in devising means to collect data on this question and to get it before the public, because we must inform the public on this subject if we are going to continue to do business."

REPORT OF BOSTON TRANSIT COMMISSION FOR 1912

The eighteenth annual report of the Boston Transit Commission covering the year ended June 30, 1912, has just been issued. The principal features are illustrated descriptions, including maps, of new and future subways and tunnels of the Boston Elevated Railway. These descriptions refer to the Cambridge tunnel, 2486 ft. long, under Beacon Hill opened March 23, 1912; the Dorchester tunnel and Boylston Street subway now under construction. Appendices are presented giving engineering and legal data, contracts, etc., on these and other works, and there is also a memorandum on the location of the proposed tunnel of the Boston & Eastern Electric Railroad. Another valuable feature of this report is the cumulative index to the commission's eighteen annual reports.

President Mellen of the New York, New Haven & Hartford Railroad has inaugurated a plan to demonstrate that the company is inclined to take care of its old and faithful employees who become incapacitated in its service. By President Mellen's direction E. O. Brown, for many years the commercial agent of the road with offices at the Grand Central Station, New York City, who retired on Feb. 1, has been placed on the pension list for the remainder of his life. President Mellen intends that all employees of long service and equal fidelity shall be similarly pensioned.

A French Single-Phase Locomotive

This 1500-hp Locomotive Is Now Being Tried by the Midi Railway—It Has a Novel Form of Drive, Recuperates Energy and Uses Induction Regulators Instead of Contactors

As noted in the *ELECTRIC RAILWAY JOURNAL* for Jan. 4, 1913, the Chemin de fer du Midi (French Southern Railway) is conducting trials with six types of single-phase locomotives on a 10-mile line at Villefranche. The following is a description of the principal features of the locomotive supplied by the Ateliers de Constructions Electriques de Jeumont, based upon an article by R. van Cauwenberghe in a recent issue of the *Elektrotechnische Zeitschrift*.

GENERAL FEATURES

The Jeumont locomotive, as shown in Fig. 1, is of the I-C-I type; that is to say, the axle arrangement comprises two leading or trailing axles and three driving axles. The locomotive weighs 86 metric tons, the weight per driving axle being 18 tons and per leading axle 16 tons. Its principal dimensions are as follows: Length over body, 41 ft. 4 in.; over the buffers, 46 ft. 11 in.; height from top of the rails to the highest position of the pantograph, 19 ft. 8 in.;

they can be connected as repulsion machines, when starting, without weakening the field. The induction regulators serve to vary the voltage without employing contactors. Recuperation is obtained by exciting the large motors by means of an auxiliary winding of the compressor motor. The control equipment at each end consists of a two-handle controller and a foot-operated switch. The four positions of handle *B* cover the forward or backward running of the motors and the corresponding positions of the reverser during recuperation. The other handle, *A*, is used to control the oil switch and the induction regulators. Also on point 1 of handle *A* the induction regulators turn to the position which corresponds to the lowest difference of potential. The contacts of the auxiliary motor for the induction regulators are thus short-circuited and the oil switch closes. On point 3 the induction regulators are operated in the opposite direction, and the voltage rises, excessive speed in rising

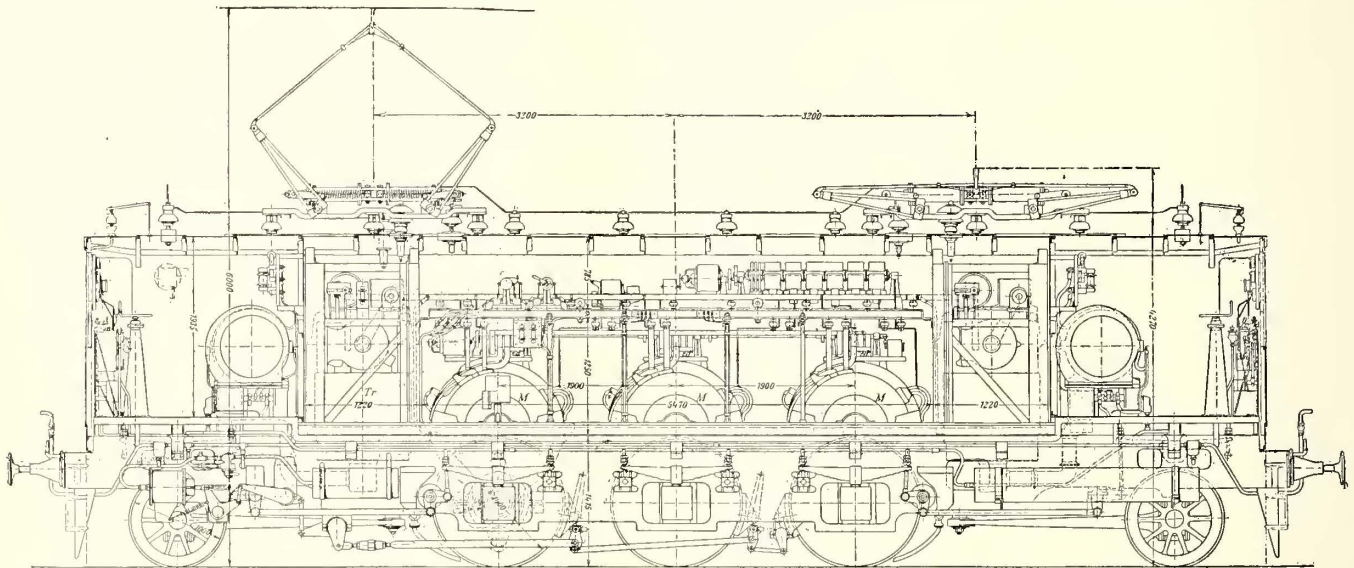


Fig. 1—Midi Locomotive—Side Elevation, Showing Arrangement of Electrical Equipment; Dimensions in Millimeters

diameter of pony wheels, 3 ft. 3 in.; diameter of driving wheels, 4 ft. 7 in. The locomotive is furnished with three 230-volt series-connected self-cooled single-phase motors which are rated at 500 hp each when running at 450 r.p.m. Under these conditions the efficiency, after including gearing losses, is 87 per cent with 93 per cent power factor. With 400 hp per motor the efficiency is 88 per cent and the power factor is 95 per cent.

The line current is conducted by means of a compressed-air switch to two 750-kw air-cooled transformers, which are connected in parallel on their high-tension side. The top yoke of each transformer carries an induction regulator. The transformers and regulators are connected in series on the low-tension side to permit the difference of potential to be varied continuously between 200 volts and 760 volts. The low-tension current then passes to the motors, which are rigidly mounted on the locomotive frame with their centers of gravity about 5 ft. 11 in. above the top of the rails. Instead of using connecting rods, each motor drives its own axle through a transmission system, which consists of gearing proportioned 1:2.72, a hollow quill concentric on the driving axle and elastic universal couplings. Uniform speed of the motors and their corresponding driving wheels is obtained electrically as hereinafter explained.

Although the motors are of the compensated series type,

being prevented by a current limit device. This insures the proper automatic acceleration as long as the motorman keeps his handle on point 3. Point 2 is used to stop the induction regulators, point *O* for cutting out the oil switch and point *OO* for cutting out all auxiliary motors.

During recuperation the action of the oil switch is dependent upon a relay after the first handle has been set. As handle *A* is successively brought to points 1 and 2, the potential gradually rises until it approximately equals the voltage of the externally excited motors, whereupon the action of the relay closes the oil switch. Handle *A* is also used for the automatic regulation of braking between speeds of 13.6 m.p.h. and 34.1 m.p.h.

The foot-operated switch effects the repulsion connection of the traction motors by means of a separate controller. This switch is used only during starting. Should it be held too long by the motorman, the series connection of the motors would be restored by a centrifugal switch upon reaching a speed of 13.6 m.p.h. The centrifugal switch also serves to cut out the recuperation connections automatically when the locomotive speed drops below 13.6 m.p.h.

DETAILS OF THE DRIVE

A detailed cross-section and sectional elevation of the drive are presented in Fig. 2. The coupling piece *C*, connected to its corresponding driving wheels, has four exten-

sions; two of these, t_1t_1 , are movable in the bronze shells c_1c_1 , which are firmly seated in arms, B , of the hollow shaft; the other two extensions, t_2t_2 , are set in the shells c_2c_2 , which are secured on the inner face of the wheel but with a certain amount of play in order to permit a slight turning of the hollow shaft or sleeving around the axle. Furthermore, the shells c_2c_2 can move in their bearings parallel to the axle so that the coupling may adjust itself to axial side play. These bearings are not rigidly seated in the wheel but are held between springs, R . Therefore, the entire coupling piece, C , is carried elastically, partly through the springs, R , and partly through the locomotive springs. The former also serve to minimize shock when starting the locomotive and to damp the vibrations which may ensue from the pulsating torque of single-phase motors. This drive has offered no trouble even at speeds of 49.4 m.p.h.

ELECTRICAL FEATURES

The voltage regulation is distinguished by the use of induction regulators which are built into the transformers. By placing the regulator in the upper yoke of the corresponding transformer, the total iron weights and losses and the space occupied are made little greater than in an ordinary step transformer of like total capacity. The copper is 18 per cent greater, but, on the other hand, contactors and auxiliary choke coils are eliminated.

The complete compensation and good commutating characteristics of the motors are obtained by two windings of different numbers of turns and copper cross-section, which are connected in parallel and set in the same slots, as shown in Fig. 3. These windings convey a commutating current displaced 90 time deg. from the main line current. This commutating current is proportional to the main current and is independent of the speed. For constant main

3.5 volts. It is zero at three times synchronous speed (about 31 m.p.h.). During slow running the repulsion connection tends to improve the commutation somewhat. When operated as repulsion motors, the windings 2 (Fig. 5), which would otherwise be idle, are connected in parallel, thereby insuring equality of field strength and causing the motors to operate at the same speed. Hence coupling rods are not

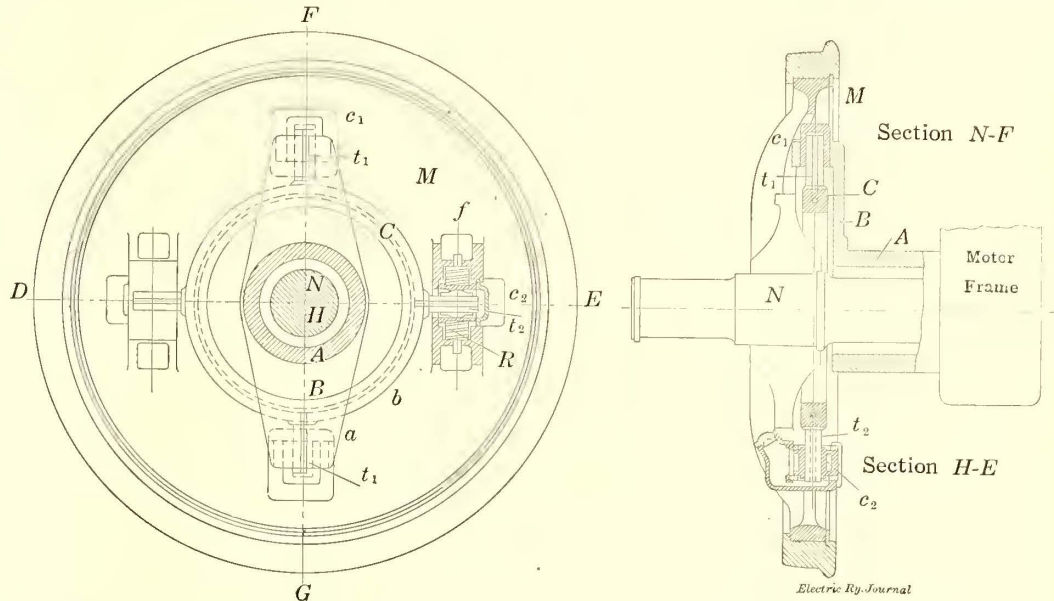
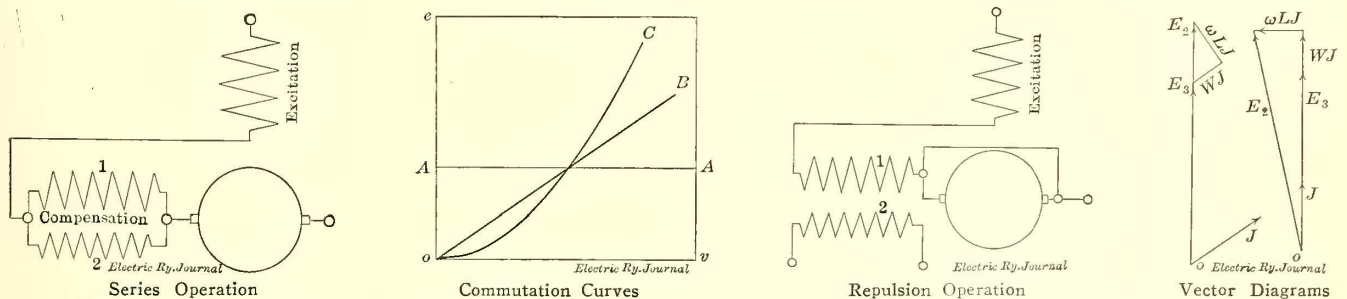


Fig. 2—Midi Locomotive—Sections of Power Transmission by Means of Universal Couplings, Quill and Gearing

required. This parallel connection is also valuable when the locomotive has to start on slippery rails.

Recuperation between a relatively wide range of speeds is obtained by means of an auxiliary stator winding in the single-phase shunt-wound compressor motors. The main windings are supplied by the transformers with a constant voltage, E_1 , in time-phase with the trolley voltage. The auxiliary windings, however, are displaced 90 space deg. with reference to the main windings, and they generate an alternating field which gives a total emf, E_2 , almost exactly in time phase with E_1 . By means of the induction regulator, the total secondary voltage, E_3 , of the transformers and regulators can be made equal to E_2 , thus enabling the closing of the oil switch. The difficulty begins here, because, as soon as an attempt is made to return energy to the



Figs. 3 to 7—Midi Locomotive—Wiring Combinations of Motors, Voltage Curves and Vector Diagrams

current—that is to say, when the excitation is constant—the voltage generated by the alternating field between the commutator bars is constant, as shown at AA in Fig. 4. The voltage generated between the commutator bars by the cutting of the commutating field is proportional to the speed and is represented by the line OB . The distance between lines AA and OB , as compared with a simple repulsion motor of like capacity, expressed by the difference between AA and the parabola CO , indicates the superior commutation of the Jeumont motor.

At full acceleration the commutator bar voltage, OA , is

line by lowering E_3 , a large phase displacement, namely, $\tan \phi = \frac{\omega L}{R}$, occurs between current and voltage, as shown in Fig. 6. In the foregoing equation, R is the ohmic resistance and ωL the leakage reactance of the motors and induction regulators. In order to raise the power factor it is necessary to displace E_2 toward E_3 , in proportion to current J as shown in Fig. 7. This is done automatically by having the current, J , flow through the primary of an air-gap transformer, so that the secondary influences the brush voltage of the compressor motors. Unfortunately the power

component of the current required for this results in an undesirable phase displacement in the main transformers which must be cared for by compensation transformers. The compensation transformers and ohmic resistances serve to compound the compressor motors so that recuperation will occur at unity power factor both in regular operation and during the period of excitation of the main motors.

OTHER EQUIPMENT

The Jeumont Company, in addition to furnishing the Midi Railway with eight more locomotives of the type hereinbefore described, has received an order to supply the following equipment for a line in the eastern Pyrénées: three 6000-volt, 25-cycle, 300-hp hydroelectric sets, four motor cars carrying four 50-hp motors each, one 1000-kw motor-generator and transformers similar to those at the Villefranche substation and overhead material for 17.7 miles of line.

PURCHASED POWER FOR THE CHICAGO, MILWAUKEE & PUGET SOUND ELECTRIFICATION

In connection with the plans for the electrification of the Chicago, Milwaukee & Puget Sound Railway from Harlowton, Mont., to Avery, Idaho, the details of the contract between the railway company and the Great Falls Power Company, mentioned briefly in the *ELECTRIC RAILWAY JOURNAL* Jan. 11, are of some interest. This contract is made part of the articles of agreement between the power company and the federal government, by which a fifty-year grant of right-of-way for transmission lines across public lands was secured.

The railway company agrees to electrify its line between Harlowton and Deer Lodge, Mont., before Jan. 1, 1918, and also agrees to buy from the power company electric energy at the rate of 10,000 kw for the full period of the ninety-nine-year agreement, but two years' notice will be given the power company that delivery must commence. The railway company has several options for more power, up to a total rate of 25,000 kw, as follows: Not less than 4000 kw, nor more than 8000 kw, if called for prior to Jan. 1, 1923; not less than 3500 kw, nor more than 7000 kw, if called for between the last date and Jan. 1, 1928; or, failing to exercise the foregoing options, the full 25,000 kw may be called for at any time between Jan. 1, 1918, and Jan. 1, 1928, if at least 6300 kw additional has been called for prior to Jan. 1, 1923. Additional energy, when once called for, as above, will be supplied for the entire remaining term of the contract. The power company is not liable for interruption to supply, nor the railway company for interruptions to its consumption, owing to causes beyond their control such as strikes, fires or floods. The contract will be broken automatically in the event that the federal government permanently enjoins at any time from the enjoyment of its privileges. The railway company is made a preferential customer entitled to first service.

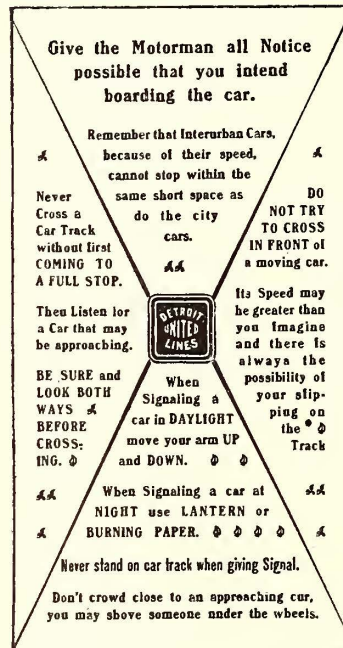
Delivery of energy will be made to not more than five stations between Deer Lodge and Harlowton, at 50,000 volts or 100,000 volts, three-phase, 60 cycles, alternating current. The voltage shall not be changed except by mutual agreement. The railway company will receive the energy at the terminals of air-break, high-tension line switches to be provided by the power company and will transform and distribute such energy to its line of railway in such manner as it sees fit. Watt-hour meters and curve-drawing wattmeters will be employed to measure the energy delivered. The railway substations are to contain sufficient synchronous machinery to secure a power factor, leading or lagging, of at least 80 per cent. Twelve months' notice will be given the power company of the location of the delivery points. The power company will also have the right to install Tirrill regulators in the substations for the operation of synchronous machinery in such manner

as to receive any power factor between 80 per cent leading and 80 per cent lagging.

The rate for energy will be \$0.00536 per kw-hr., subject to a minimum bill after the first year of service equivalent to 60 per cent of all the energy contracted for. The power company is also required to pay the federal government a tax of 5 mills per 1000 kw-hr. for all energy delivered over transmission lines crossing the public domain. The power company also has the conditional right to occupy the railroad right-of-way with its transmission lines, subject to sixty days' notice of removal, and such transmission lines shall not interfere with the operation of the railway or its telephone or telegraph lines. The railway company is forbidden to resell any of the energy purchased of the power company. Disputes of any nature between the two companies will be referred to and settled by a board of three arbitrators, chosen one by each company and the third by these two.

SPEED NOTICES ON DETROIT INTERURBAN LINES

The publicity department of the Detroit United Railway has recently prepared an advisory notice of the character reproduced in the accompanying illustration relative to the necessity for caution when using interurban cars. The company has found that residents of the larger towns when out in the country do not realize the higher speed of interurban cars, and hence they often fail to signal them in time. The notice not only calls attention to this fact, but also explains how the cars can be most effectively signaled. Furthermore, this notice will act as a warning against accidents, inasmuch as it impresses the passenger with the need for exercising caution when crossing the tracks or boarding a car. This notice has been printed in three sizes, namely, poster type for shelter stations and waiting rooms, medium size (8½ in. x 11 in.) for tacking on telephone poles, etc., at cross-roads, and pocket size (2¾ in. x 5¼ in.) for distribution on the cars.



Warning Notice on Interurban Speeds

tacking on telephone poles, etc., at cross-roads, and pocket size (2¾ in. x 5¼ in.) for distribution on the cars.

THE ASSOCIATION PROCEEDINGS

The bound proceedings of the American Electric Railway Association for the convention of 1912 are now being distributed to members from the office of Secretary H. C. Donecker. As customary, a separate volume is devoted to the American, the Engineering, the Accountants', the Transportation & Traffic and the Claim Agents' Association respectively. An excellent frontispiece portrait of the president of each association accompanies the individual volumes. The proceedings of the five associations as published make 2744 pages, the Engineering proceedings alone totaling 978 pages. A valuable feature of the volume for this year is the summary index of previous reports of the various associations, including the earliest proceedings of the American Street Railway Association.

Hearing on Electric Railway Mail Pay.

A Report of a Meeting of a Joint Committee of Congress at Which Representatives of the Companies Showed that Their Costs of Operation Were Above the Compensation Received and Asked for Higher Terms of Payment—Detail Figures of Cost

A series of hearings on the subject of railway mail pay is being held in Washington before the Senate committee on post offices and post roads and before the joint House and Senate committee on postage on second-class mail matter and compensation for the transportation of mail. At the hearing on Feb. 7 representatives of the electric railways submitted statements showing the cost of operation of their mail cars and the government rate of payment for this service. The statements showed that the operations are conducted at a loss.

Those who attended the hearing were Henry S. Lyons, secretary Boston Elevated Railway; J. H. Neal, general auditor Boston Elevated Railway; Alexander R. Piper, general freight agent Brooklyn Rapid Transit Company; F. C. Hamilton, statistician Chicago Railways; W. F. Ham, vice-president Washington Railway & Electric Company; John Wilson Brown, president Maryland Electric Railways; Senator Jonathan Bourne, Jr., of Oregon, chairman of the committee; Representative Lloyd of Missouri, Representative Tuttle of New Jersey and Representative Weeks of Massachusetts.

The hearing of Mr. Neal covered almost all the points involved. Senator Bourne, as chairman, asked Mr. Neal if he was familiar with the bill prepared and suggested to Congress by the Post Office Department under which it was proposed to substitute space for weight as the measure of compensation for the service rendered in the readjustment of railway mail pay.

Mr. Neal said that he was chairman of the committee appointed by the American Electric Railway Association to take this matter up with this committee.

Thus far, Mr. Neal said, the Boston Elevated Railway had been paid 1 cent per linear foot for each car mile run. The company also had the pouch service, for which it was paid a certain rate per pouch. The company had been receiving for cars which were called 16-ft. box ears, but which measured a little less than 16 ft. on the inside, 15½ cents per car mile for the work that it had been doing for the government.

For years it had been well known to various committees and to various postmasters and certainly to all the railways, Mr. Neal said, that this rate of compensation was absolutely inadequate, and for years the railways had been pointing this out in various ways, but up to the present time they had not been able to do so in such a manner that they had received any increased compensation. It was a very easy matter to show that the present rates were causing a loss to the Boston Elevated Railway alone of \$15,000 a year.

The Boston Elevated Railway received substantially \$35,000 a year from the government for the mail that was carried at a loss.

In answer to a question of why, as the company was not obliged to carry this mail, it assumed a burden which necessitated a loss, Mr. Neal, speaking for the American Electric Railway Association, said that, in the first place, many roads undertook to carry United States mail at unremunerative rates with the idea that it would help them in cases of labor trouble to keep their cars running.

Second, operating expenses formerly were less than at present, but the carriers had continued from year to year in the hope that the government would recognize the value of the services rendered and increase the rates to an equitable basis. The electric carriers now realized that the business was unprofitable and undesirable at the present rates and asked that the government equalize the existing rates paid

for the different classes of mail transportation so that the electric lines could consistently obtain a reasonable proportion of the business on a fairly remunerative basis.

As far as the Boston Elevated Railway was concerned, Mr. Neal said that the feeling had been that the company would be able eventually to get an increased appropriation. It had taken the matter up year after year, hoping that this would be granted. It was felt that perhaps some hardship would be caused by a withdrawal of the service, and it was hoped that whatever prevented a proper compensation would be overcome, but the matter had reached a point now where Mr. Neal thought the company should not be asked to carry any further a burden as great as this.

Continuing, Mr. Neal expressed the opinion that the practice of the past would show that if the space rate were increased to at least 1½ cents instead of 1 cent, the cost would be met at any rate.

Representative Lloyd asked whether some other system of accounting could not be adopted.

Mr. Neal answered that that question would require some further study on the part of the electric railways. He thought that it would be almost impossible to compare the carrying of mails in city service with the steam railroad practice. The difference between train operation and individual car operation was great, and he knew of no precedents on which he could base any statements to permit him to make a comparison that he would dare to stand on or to make a contract on.

On the other hand, this practice of paying according to the length of a car, which had been in use for years and years, gave a greater compensation for a long car and a lesser compensation for a short one and involved in that way payment according to space. As a matter of practice it was shown that if 50 per cent more compensation had been received, which would have been just to the companies, that would fix a basis for payment on the city service which would be satisfactory and was perhaps the best all around.

Senator Bourne said that as he understood it the company was perfectly satisfied to have space the determining factor as to compensation but was dissatisfied with the rate received for the space.

Mr. Neal answered that with one modification that was so; he would add, if the rate was 1½ cents per linear foot there should be an allowance of not less than 30,000 miles for a car.

Senator Bourne asked if this allowance was desired without regard to the mileage actually made.

Mr. Neal replied in the affirmative, adding that if the government said that a company must set aside a certain number of ears, the fixed charges, the arrangements for crews and other incidental expenses put the roads to a considerable expense. The Boston Elevated Railway last year averaged something like 25,000 miles per car.

Senator Bourne asked if, when the companies considered the advisability of extending any of their electric lines they took into consideration the returns they would receive from the government for the transportation of mail.

Mr. Neal said that this was considered only indirectly. He said it would be taken into consideration if an extension into one of the suburbs was contemplated. Mail would be one of the determining factors if there were post offices in that suburb and would not be if the line appeared to be away from any post office district.

In answer to a question Mr. Neal said that mail was merely a by-product of an electric railway and that electric

railway operations to-day involved the carrying of mail, newspapers, trolley passengers and express.

Representative Weeks declared that that was not an especially practical question as applied to Massachusetts because in that State railroad extension had been hedged

STATEMENT GIVING ESTIMATED COST OF OPERATION OF PRESENT TYPE OF MAIL CARS ON SYSTEM OF THE BOSTON ELEVATED RAILWAY

Type and number of cars now used.....*9 16-ft. box	
Mileage operated year ended June 30, 1912.....	225,695
	Cents per Car Mile
(A)—Car investment—Taxes, interest, depreciation and insurance..	1.338
(B)—Carhouse storage—Taxes, interest, depreciation and insurance	0.187
(C)—Power station—Taxes, interest, depreciation and insurance...	1.229
(D)—Power transmission—Taxes, interest, depreciation and insurance	0.198
(E)—Track investment.....	2.441
(F)—Cost of power used.....	1.350
(G)—Wages of car crews.....	8.422
(H)—Maintenance of car bodies.....	0.482
(I)—Maintenance of car trucks.....	0.200
(J)—Cost of maintenance of track.....	1.500
(K)—Wages of other transportation and car service employees and other expenses.....	1.680
(L)—Maintenance of line equipment, buildings and electric equipment of cars.....	1.320
(M)—General expenses.....	2.790
Total.....	23.137
Pay for 16-ft. box car (15 ft. 11 in. inside).....	15.58

*Not including one 25-ft. box car.

DETAILS OF ESTIMATES

(A)—Car Investment:	
Original car body.....	\$500.00
Rebuilding car body.....	640.13
Heaters, without wiring.....	23.00
Harrison racks.....	25.00
Wire guards.....	28.12
Fire extinguishers.....	14.50
Electric equipment and equipping.....	117.96
K-2 controllers.....	168.00
G-58 motors (two at \$455).....	910.00
Peckham truck.....	220.00
Vestibuling.....	167.75
Investment per car.....	\$2,814.46
For nine cars.....	\$25,330.14
Taxes and insurance, \$9.25 per \$1,000 (assuming capital to be composed of one-half stock and one-half bonds).....	\$234.30
Interest at 5 per cent (the average amount paid on West End and Boston Elevated capital is 5.09 per cent).....	1,266.51
Depreciation, 6 per cent.....	1,519.81
	\$3,020.62
Investment charges per car mile (on mileage operated year ended June 30, 1912).....	1.338
(B)—Carhouse Investment:	
Length of car from bumper to bumper, 25 ft., 300 sq. ft., required for housing, at \$1.75 for land and buildings.....	\$525.00
For nine cars.....	4,725.00
Taxes and insurance, at \$9.25 per 1000 (as above)...	\$43.71
Interest, 5 per cent.....	236.25
Depreciation, 3 per cent.....	141.75
	\$421.71
Per car mile (on mileage operated year ended June 30, 1912).....	0.137
(C)—Power Investment:	
Power station investment, 16 kw per car, at \$175 per kw.....	\$2,800.00
For nine cars.....	25,200.00
Building (30 per cent), \$7,560.00; interest, 5 per cent.....	\$378.00
Building (30 per cent); depreciation, 3 per cent.....	226.80
Equipment (70 per cent), \$17,640.00; interest, 5 per cent.....	882.00
Equipment (70 per cent); depreciation, 6 per cent...	1,058.40
Taxes and insurance, \$9.25 per 1000 (as above).....	233.10
	\$2,778.30
Per car mile (on mileage operated year ended June 30, 1912).....	1.229
(D)—Power Transmission Lines:	
(16 kw per car at \$45 per kw.)	
For one car.....	\$720.00
For nine cars.....	6,480.00
Interest, 5 per cent.....	\$324.00
Depreciation, 1 per cent.....	64.80
Taxes \$8.98 per \$1,000 (assuming capital to be one-half stock and one-half bonds).....	58.19
	\$446.99
Per car mile (on mileage year ended June 30, 1912).....	0.198
(E)—Track Investment:	
Charges taken at the average cost per mile for the entire surface system:	
Investment.....	\$9,300,000.00
Car mileage.....	45,427,857.00
Interest, 5 per cent.....	\$465,000.00
Depreciation, 6 per cent.....	558,000.00
Taxes, \$9.25.....	86,025.00
	\$1,109,025.00
Per car mile (on mileage year ended June 30, 1912).....	2.441

		Cents per Car Mile
(F)—Cost of Power Used:		
Cost of power taken, at \$0.0075 per kw-hr.		
Car uses 1.8 kw-hr. per mile.		
Cost per mile.....		1.350
(G)—Wages of Car Crews Year Ended June 30, 1912.		
\$18,032.29		
Add for effect of nine-hour law, figures for which are not yet obtainable.....	1,000.00	
		\$19,032.29
Mail car mileage.....	225,695	
Cost per car mile.....		8.422
(H)—Cost of Maintenance of Mail Car Bodies:		
Thirty-three months ended June 30, 1912.....	\$2,244.35	
Add proportion of cost for painting to be done later.....	750.00	
		\$2,994.35
Average cost for one year.....	1,088.88	
Cost car mile.....		0.482
(I)—Maintenance of Car Trucks, Including Wheels and Axles, Brakeshoes, etc.:		
Taken at the average cost for four years for the type of trucks used on mail cars per car mile.....		0.20
(J)—Cost of Maintenance of Tracks per Car Mile Estimated by Mr. Hile.....		
		1.500
(K)—Wages of Other Transportation and Car Service Employees and Expenses:		
Taken at the average cost per car mile for about 46,000,000 car miles on the entire surface system:		
Superintendence of transportation, including division clerks, starters, street inspectors, etc.....	0.55	
Switchmen.....	0.12	
Lamps, lubricants, waste, etc.....	0.15	
Carhouse employees and expenses.....	0.53	
Wrecking expenses.....	0.01	
Miscellaneous car service expenses.....	0.07	
Labor, cleaning and sanding track.....	0.15	
Oil, grease, sand, etc.....	0.01	
Snow expenses.....	0.09	
		1.68
(L)—Maintenance of Line Equipment, Building and Electrical Equipment of Cars:		
Taken at the average cost per car mile for about 46,000,000 car miles on the entire surface system:		
Maintenance of line equipment.....	0.34	
Maintenance of buildings.....	0.22	
Maintenance of electrical equipment of cars.....	0.60	
Superintendence of equipment.....	0.16	
		1.32
(M)—General Expenses:		
Taken at the average cost per car mile for about 46,000,000 miles on the entire surface system:		
Salaries, office and general expenses.....	0.53	
Law expenses.....	0.23	
Pensions and gratuities.....	0.04	
Miscellaneous expenses.....	0.39	
Injuries and damages.....	1.43	
Stationery and printing.....	0.16	
Rent of tracks, terminals.....	0.01	
		2.79

around with so many obligations that most people did not want to put money into extensions and were not making them.

Senator Bourne said that the point he wanted to draw out was that no railway extensions were made on account of mail contracts, and that the mail-carrying contract was a by-product.

Statements and exhibits were submitted by representatives of the various companies in regard to their operations.

Mr. Neal, explaining the statement submitted on behalf of the Boston Elevated Railway, which is published herewith, said in answer to questions from Senator Bourne that he showed exactly what it costs for the investment in a car, maintenance of the car, wages of the men who operated the car, cost of power and various other elements that went to make up this cost and to demonstrate the loss indicated. In preparing the statement he took the actual power the mail cars were using. He had had a meter put on the cars.

Mr. Neal said further in regard to this statement that in trying to find out what the service cost he first looked to see how many cars were in use for this purpose and found there were ten, one of which was a 25-ft. box car. The other nine cars were 16-ft. cars, so in order to make the statement plain he eliminated the 25-ft. box car. For the nine 16-ft. box cars he found the investment to be \$2,814.46 per car.

Mr. Neal went through the statement, explaining the various items, in answer to questions by the committee.

Similar explanations as to the statements were made by

the other railway representatives who were present at the hearing.

F. C. Hamilton, Chicago Railways, made an oral statement of the results of operation of mail-car service on the lines of that company. He explained that he would file a statement with the committee but would not do so until such a statement had been authorized and approved by the Board of Supervising Engineers, Chicago Traction.

A. R. Piper, general freight agent Brooklyn Rapid Transit Company, submitted to the committee the rates of compensation recommended by the American Electric Railway Association's committee on compensation for carrying United States mail. These figures were printed on page 821 of the *ELECTRIC RAILWAY JOURNAL* for Oct. 11, 1912.

APPLYING THE CAR TRUST PLAN TO THE PURCHASE OF ELECTRIC RAILWAY EQUIPMENT

The Philadelphia banking interests of Drexel & Company, Brown Brothers & Company and Edward B. Smith & Company are back of the Philadelphia Equipment Securities Company, the incorporation of which was noted briefly in the *ELECTRIC RAILWAY JOURNAL* recently. As previously stated the purpose of the new company is to aid electric railways in the purchase of new equipment by acting as bankers and purchasing and marketing issues of car trust certificates.

The equipment trust plan was devised about forty years ago by steam railroads which wished to provide themselves with cars and locomotives and did not care to finance these purchases out of earnings or impair their surplus accounts. It is the plan followed by the steam railroads so successfully which the Philadelphia Equipment Securities Company proposes to bring to the electric railways. The method followed is simple: An electric railway which desires to increase its equipment orders cars from the car builders and pays down at the time of delivery, say, 25 per cent of the total cost of the new rolling stock. The balance of the debt is distributed over a period of ten years by means of a semi-annual rental, which provides funds for the retirement of the car trust certificates, and distributes the debt so that it does not prove burdensome.

The plan also possesses another feature which is very attractive to operating companies. A steady income is provided from the operation of the cars during the time that they are being paid for. In the case of steam railroads many companies market their car-trust securities direct, the issues being large enough to attract investment bankers. On account of their smaller requirements electric railways have found it difficult to interest bankers in notes given for the purchase of new equipment, and car builders have been loath to accept paper when any other arrangement could be made.

The Philadelphia Equipment Securities Company proposes to bridge the gap between the railways and the car builders on the one hand and the investing public on the other hand by purchasing the car trust certificates of electric railways, placing them in the hands of a trustee and issuing against such deposit its own equipment trust bonds.

There are now outstanding approximately \$320,000,000 of railroad equipment trust bonds. Orders for approximately \$30,000,000 of electric railway cars were placed last year, and the applicability of this method of financing the rolling stock needs of the electric railways has been the subject of several articles in the *ELECTRIC RAILWAY JOURNAL*.

The officers of the Philadelphia Equipment Securities Company, Philadelphia, Pa., are as follows: Arthur E. Newbold, president; Thomas Newhall, vice-president; Gerald Holsman, treasurer; J. Clifford Rosengarten, secretary; Arthur E. Newbold, George H. Frazier, Edward B. Smith, Horatio G. Lloyd, Thomas Newhall, directors.

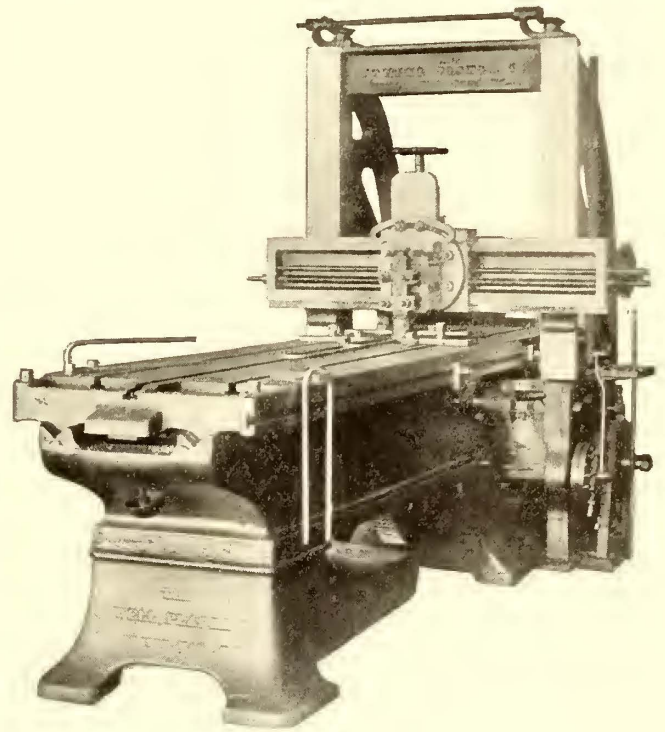
MAINTENANCE NOTES FROM BALTIMORE

Various shop practices of the United Railways & Electric Company, of Baltimore, have been described from time to time in these columns, but in view of the low maintenance costs which this company has attained, it may be of interest to present some additional data on this subject. For the year 1912, for example, the cost per 1000 car miles for the maintenance of motors, including lubrication, carbon, brushes, gears and pinions, was only \$1.24, or, on the basis of 1000 motor miles, approximately 31 cents. The policy that has been instrumental in producing this result may be presented under two heads as follows:

First, careful inspection and attention to the small and seemingly trivial details to keep motor equipments in first-class condition.

Second, special arrangements for the proper lubrication of each type of motor whereby the armature bearing is oiled most effectively every thirty days and the axle bearings every 1800 miles.

No extensive attempt has been made to execute the overhauling of cars on the mileage basis, as under the present



Baltimore Shops—Bending Straight Stock into U's for Wheelguard Fingers

shop conditions the amount of extra clerical help required to follow the records would entail too much expense. The disadvantage of the straight time system is avoided, however, by having each carhouse adopt that car maintenance interval which is best adapted for its particular type, service and schedule. In accordance with this practice, each car is thoroughly gone over from the trolley pole to the truck at periods varying from eight to ten days.

The thorough nature of this inspection will be apparent from the following statement concerning the motor equipment: Motors are fibered with strips 0.125 in., 0.075 in. or 0.050 in. thick for proper armature clearance and worn bearings; interior of the motor frame around the fields blown out and cleaned; all motor leads and wires carefully inspected so new material may be applied if any connection shows indications of burnt tape or brittleness; all wiring exposed to the elements or to oil cleaned and painted to preserve the insulation; brush holders and brush-holder shunts examined for indications of burning, and brushes for side

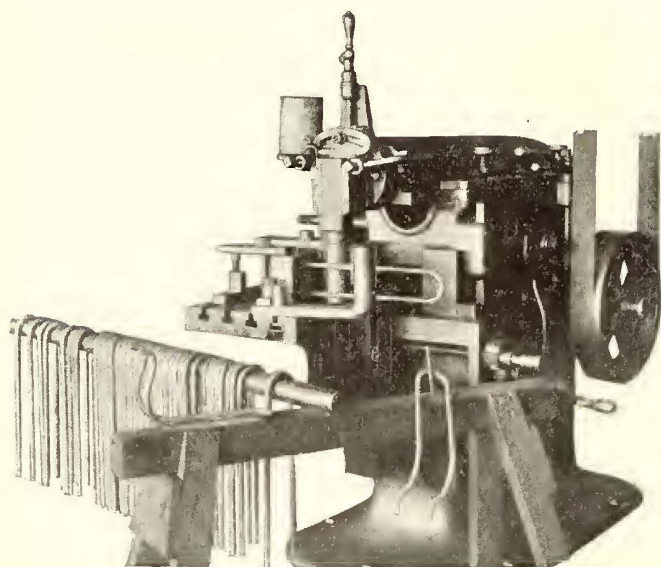
wear; all motor fastening or supporting bolts examined for tightness. Furthermore, each carhouse is supplied with a water-barrel rheostat and an ammeter to test the circuit breakers every month at the amperage fixed as standard for the given service. It is clear from the foregoing that everything possible is done to maintain the motor equipment and other parts of the car in as good condition as when they first left the shops for service.

GEARS AND PINIONS

The company is gradually adopting solid gears which are installed on the 4½-in. and 5-in. axles at 45 tons to 60 tons pressure. Forged steel gears have been purchased recently for trial, and case-hardened pinions and gears are also on test. Gears are inspected every eight or ten days and lubricated when the inspection shows that they actually need lubricant. The grease used is heavy in consistency and cheap in cost.

MOTOR PRACTICES

Much of the success which the company has attained in keeping its maintenance costs low is doubtless due to the accurate handling of supply parts. Thus templates are used



Baltimore Shops—Bending Wheelguard Fingers on a Shaper

for brush-holder yokes and all brush holders must fit their respective jigs perfectly before they are placed in the motor.

A brick oven, which is steam-heated in winter and electrically heated in summer, is used for making motor coils. New armature coils are first placed in the oven to dry, and then plunged into a compound of 0.865 specific gravity which has been heated by a steam coil to about 90 deg. Fahr. As the warm compound is thin, this treatment thoroughly impregnates the cotton. Gasoline or benzine was formerly used as a thinner, but it was found that these chemicals destroyed the body of the varnish. After impregnation the armature coil is returned to the oven for the final baking. The same compound is used in making field coils except that it is mixed with French chalk to form a mixture of the consistency of molasses. This mixture is then applied to every turn of the field form as the coil is being wound in order to obtain a compact solid mass. After this treatment the coil is thoroughly baked in the oven.

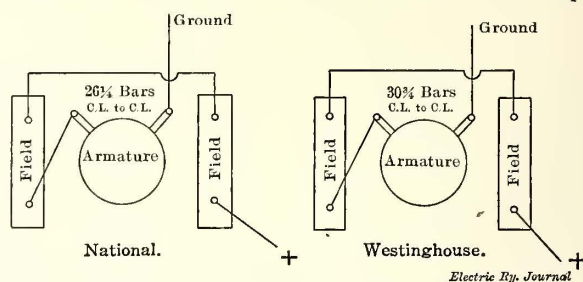
Standard instruction prints 5¾ in. x 4½ in. in size have long been used in these shops to aid the shopmen in making the proper connections of motors, setting of brushes, etc. The wiring and brush-setting diagrams for National and Westinghouse compressors reproduced herewith have recently been added to the album of instruction prints.

SHOP ECONOMIES

An interesting piece of axle welding has recently been carried out in the blacksmith shop, where two pony axles have been made out of three old motor axles by cutting off

the journals and welding in a new piece which is long enough to extend the pony axle to the proper length. Such rewelded axles have been found of ample strength for use with pony wheels. Including overhead charges, they cost but \$4 each against \$12 for new axles.

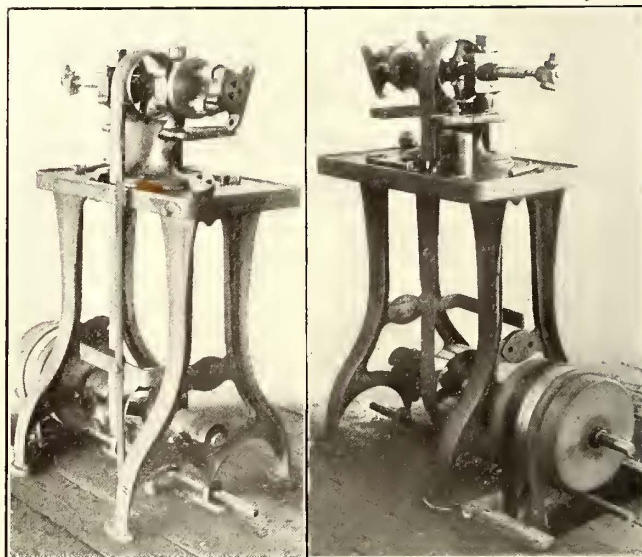
One of the illustrations shows a reversible emery grinder which was reconstructed to grind valves at one end of the shaft and drain cocks at the other end. The prin-



Baltimore Shops—Connections for Compressor Motors

cipal changes required to adapt the grinder for this purpose were the installation of a new shaft and of a mandrel for holding the valves. The valves are principally of the rotary type, but slide valves can also be ground on these machines, although they require a little hand finishing.

Two other illustrations show how a planer and shaper are used for making wheelguard fingers. The first step is to place the original stock, consisting of 35-in. bars of ½-in. diameter, between guide pieces or blocks upon the bed of the planer to bend them into long "U's," as illustrated. These pieces are then placed in the shaper for two additional bendings. The first bend is made along the sides of the "U" by means of an old car axle which has been indented for this purpose. The ends of the fingers are turned up through the same movement of the machine after they have been anchored in the two ¾-in. holes of the block shown alongside the indented axle. The ends have to be turned to this final curvature to permit their attachment to the woodwork of the wheelguard. The grooves of the shaping axle are constantly lubricated by gravity oil feed.



Baltimore Shops—Valve and Drain Cock Grinder

It has been found that the planer and shaper permit this work to be done six to ten times faster than is possible in the blacksmith shop because they eliminate the need of subjecting the stock to three different heats.

Acknowledgments are due to William A. House, president, and A. T. Clark, superintendent rolling stock and shops, for the information on maintenance practices and shop devices presented in this article.

GAS-ELECTRIC MOTOR CARS FOR THE CHICAGO, MILWAUKEE & PUGET SOUND RAILWAY

The Chicago, Milwaukee & Puget Sound Railway Company has recently placed two gas-electric motor cars in service on branch lines in the State of Washington. One of them is operating between Everett and Monroe, a distance of 14 miles, and makes five single trips per day, totaling 70 miles, while the other runs from Seattle via Cedar Falls to Enumclaw, a distance of 62 miles, and makes one round trip each day, covering 124 miles. Both cars were built by the General Electric Company.

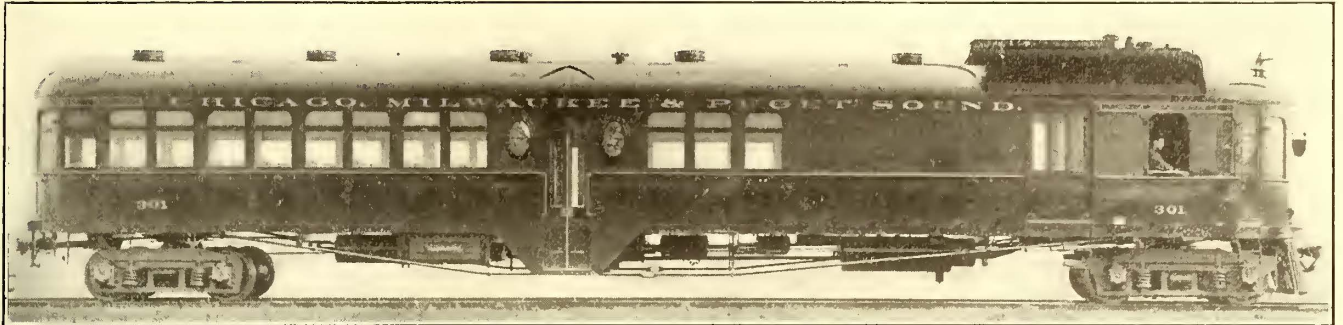
The cars are of the combination passenger, smoking and baggage compartment type. They are 70 ft. 5 in. long, 10 ft. 5 in. wide, weigh approximately 50 tons and have a

tracks and covered the distance to Tacoma, Wash., 2201 miles, in ten days, daylight running.

The car in question averaged 220 miles per day, and one day covered 315 miles. A run from Malden to Othello, Wash., 103 miles, was made in two hours and ten minutes, and in one case 20 miles of 2.2 per cent grade was negotiated in fifty-six minutes with one stop.

640-HP WORK-CAR LOCOMOTIVE FOR THE BOSTON ELEVATED RAILWAY

Among the several service cars included in the rolling stock of the Boston Elevated Railway is a high-powered work-car locomotive built by the company in its own shops.

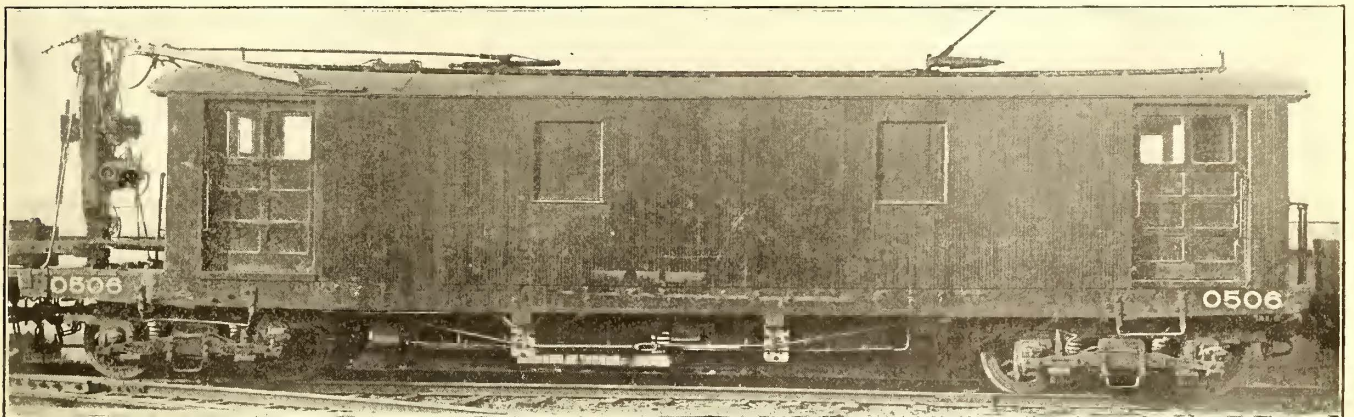


Gas-Electric Car for the Chicago, Milwaukee & Puget Sound Railway

total seating capacity for seventy-seven people. The cab in front containing the power plant apparatus is 11 ft. 11 in. long; next is the baggage room, 15 ft. long; then the smoking section, 10 ft. 11 in. long, and the passenger compartment, 27 ft. 5 in. long. A center vestibule with side entrances runs crosswise between the passenger and smoking compartments. The smoking section provides twenty seats and the passenger compartment fifty-seven.

The generating unit consists of an eight-cylinder, four-cycle gas engine of the "V" type, direct-connected to a 600 volt commutating-pole electric generator. An auxiliary hand-started equipment is also provided to start the main engine and run the lighting generator. Mounted on the axles of the forward truck are two GE-205 600-volt box-frame, oil-lubricated, commutating-pole 100-hp motors.

In general service this car hauls rails and construction material on the elevated division of the Boston Elevated Railway. Frequently it must haul four loaded cars of steel rails and at the same time keep clear of the regular service. The motors of this locomotive therefore are geared to the same speed as those operating on the passenger trains. The car is 46 ft. 4 in. over all and 32 ft. 3 in. between center pins and weighs completely equipped 81,350 lb. Four Westinghouse commutating-pole No. 301-D 160-hp, 600-volt box-frame motors are used to propel this locomotive. The control equipment consists of two sets of straight type HL unit-switch control double equipments, one set consisting of a line switch, switch group, reverser and control resistor, controlling the motors on one truck, while one line switch, one switch group and control resistance operate the motors



Boston Work Car with Pneumatic Hoist at One End

A hot-water heater, coal-fired, is installed for heating the car. To prevent freezing in cold weather when the car is lying idle the heater circulation may be connected to the engine-cooling system. A 150-gal. gasoline tank for the power supply is suspended under the car.

Both of these cars made the long trip across the western part of the continent under their own power. One of them left Chicago on the Chicago, Milwaukee & Puget Sound

on the other truck. A Westinghouse air-operated hoist of 15 tons capacity is mounted on one end of this car. The interior of the car is supplied with tools and wrecking paraphernalia.

Mounted underneath the locomotive are the following pieces of apparatus: Two line switches, two switch groups, two reversers, two control resistors, eight frames of grid resistors, four reservoirs and four air compressors.

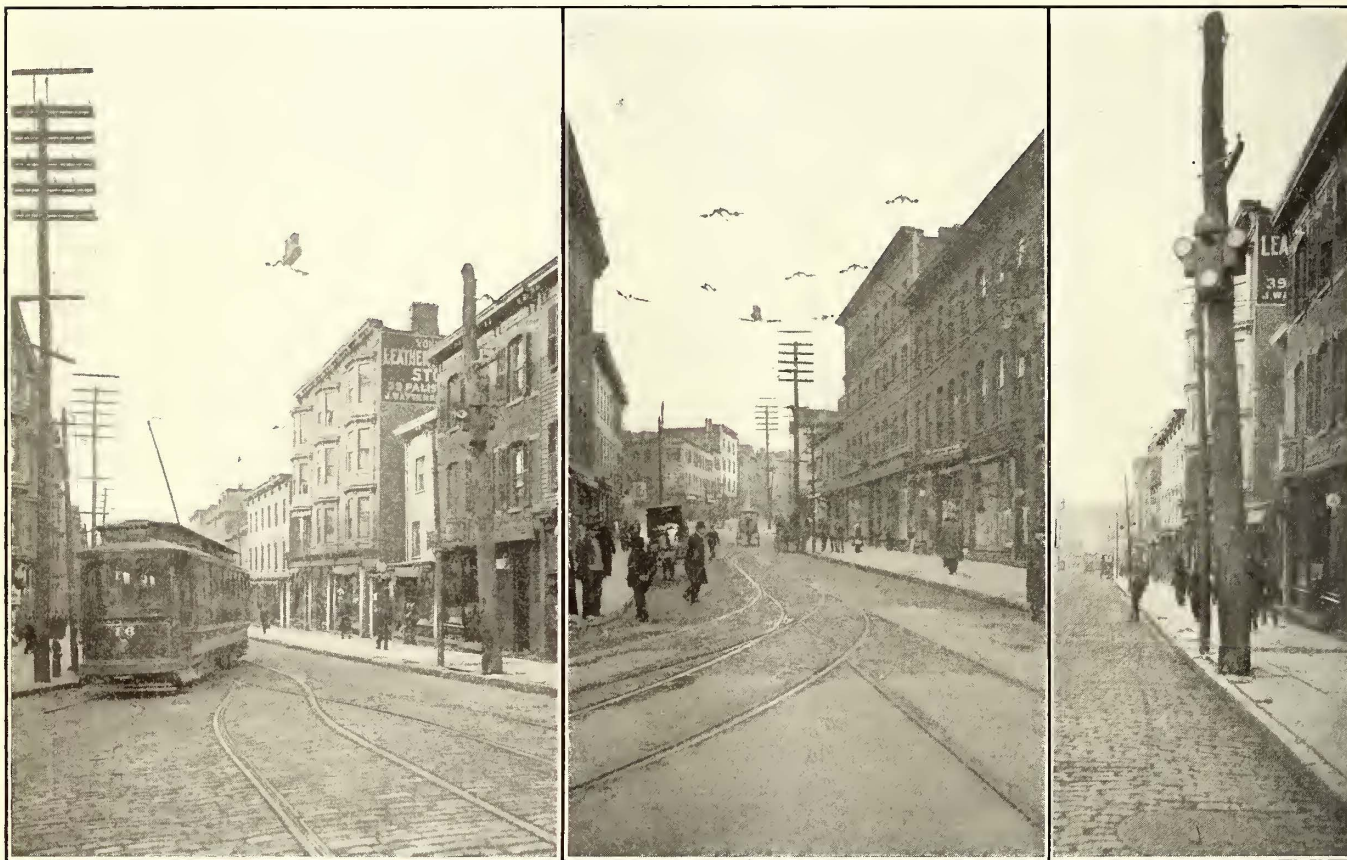
OVERHEAD SIGNAL INSTALLATION AT YONKERS

An interesting example of how a simple overhead signal system can be employed to improve car-operating conditions at a highly congested point is the installation made recently for the Yonkers (N. Y.) Railroad by the United States Electric Signal Company, West Newton, Mass. The traffic center of Yonkers is Getty Square, where seven of this railway's nine lines converge. Of these lines four come inbound and one goes outbound over an 800-ft. section of single track on Palisade Avenue between Getty Square and Elm Street. The difficulties of the situation are increased by the condition that all the converging thoroughfares enter Getty Square on steep grades. Furthermore, the square is also the passing point for a great deal of vehicle traffic owing to the fact that its Main Street outlet presents the easiest route between the eastern and western part of Yonkers. The layout of streets near the section

has met satisfactorily on the Palisade Avenue section of single track are clear from the accompanying table, which shows the number of cars operated a day and also the rush-hour headways of the different lines.

NUMBER AND HEADWAY OF CARS ON YONKERS LINES		
	Trips Through	Rush-Hour
	Palisade Avenue	Headway, Minutes
Inbound		
Mount Vernon.....	96	12
Tuckahoe	108	10
		(double headers 5:30 p.m. to 7 p.m.)
Nepera Park.....	83	15
Park Avenue.....	159	5
Outbound		
Park Avenue.....	159	5
		(a few double headers)
Cars per day.....	605,	or cars per year, 220,825

The schedule thus calls for the operation of 159 outbound cars and 446 inbound cars, the headways of the several lines ranging from twelve to five minutes. This condition, of course, made it necessary to install a counting



Yonkers Signal Installation—Overhead Switch and Pole Signal Outfits at Opposite Ends of the Palisade Avenue Single-Track Section

which has been furnished with signals is shown in a diagram on page 297. The second diagram shows the usual directions of car movement.

The signals at Elm Street, like those at Palisade Avenue and Getty Square, are connected for two-way operation, which arrangement takes care of the possibility of re-routing and emergencies. Under the ordinary conditions of operation the Palisade Avenue section is used for one outbound and four inbound routes, as previously noted. The Palisade Avenue branch-off is operated in both directions, the Elm Street line is inbound only, while the New Main Street line is operated one way for the Mount Vernon, Tuckahoe and Nepera Park cars and both ways for McLean Avenue. The Main Street line, which connects with the station of the New York Central & Hudson River Railroad, is double-tracked for its entire run from Getty Square to the station.

The heavy operating conditions which the signal system

mechanism in each signal. It is possible to have fifteen cars in a block, but in practice not more than six cars have ever been so operated and the usual time of passing this number through the block does not exceed five minutes. The equipment was installed during December, 1912, and has since operated with the greatest satisfaction. The apparatus consists of one United States K-2 lamp and disk signal outfit at Getty Square, a similar equipment at the junction of Palisade Avenue and Elm Street and six overhead switches. A detailed description of the working parts and wiring connections of the equipment follows:

A block of these signals consists of two signals, each equipped with two side semaphore attachments. Provision is made in each signal for the display of a red or danger aspect by light shining through a 5-in. lens and the display of a red signal disk through a circular glazed window in the lower part of the box at such time as is determined by the signal mechanism.

The semaphores are enameled white sheet-metal disks with green center inclosed in cases hung on each side of the main signal case. The semaphore case has round glazed windows through which the semaphore disks may be seen, and a lamp is placed within to illuminate them. These disks are pivoted on horizontal shafts which have a side-to-side direction and are held nominally in a horizontal position so that the edges only are presented to view.

When a car enters a block one of the white semaphores is turned into a vertical position, presenting its whole area to view, and is illuminated at the same time. This is the signal display at the entrance end of the block for the first car and indicates that the red light and red disk, which are danger signals, are displayed at the other, or exit, end of the block.

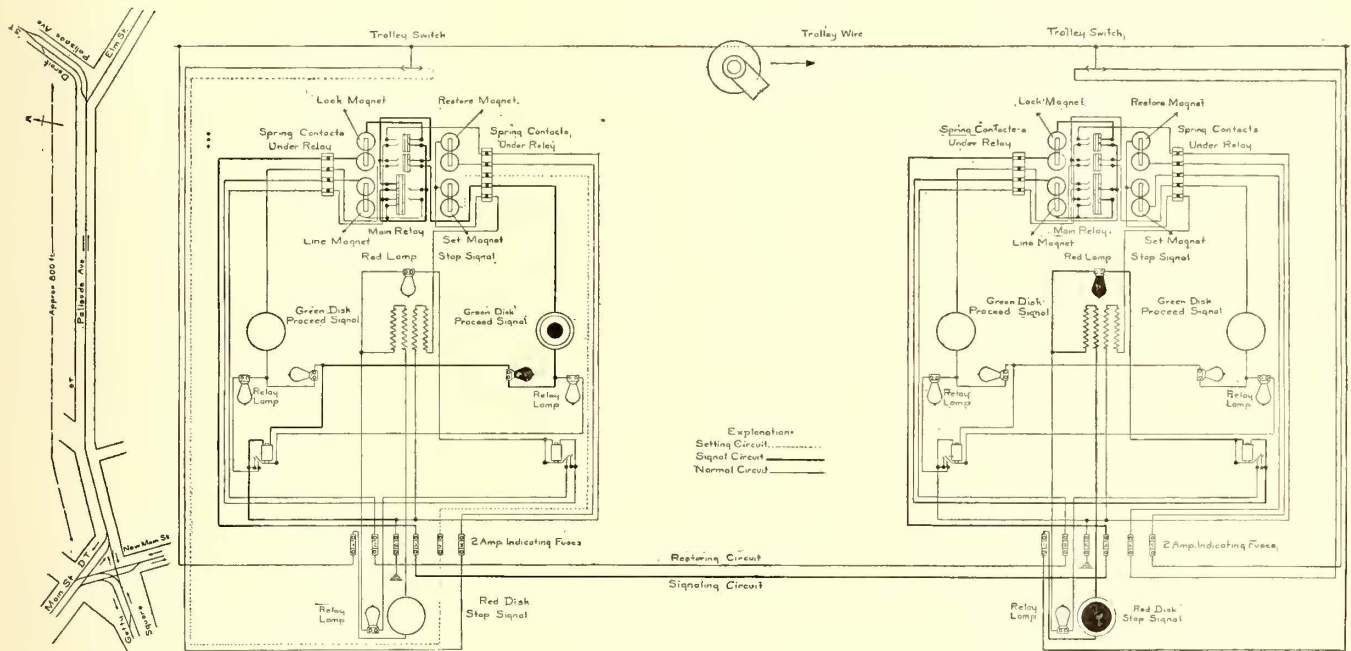
A following car operates to restore the semaphore set up by the entrance of the first car to its normal or horizontal position and to rotate the other disk to the vertical position, thereby presenting its broad side to view. This change of display from one semaphore to the other indicates that the second car has been properly counted in. Each following car will in turn drop the semaphore disk it finds set up and set up the other one, the operation taking

the block as the exit end until the block is again restored to normal.

The signals are connected by two line wires, and each signal is connected to the setting end restoring switches at its end of the block. Each signal has also a feed wire from the trolley wire and a ground wire connecting it with the track. Thus there are six wires entering each signal. Each signal contains, besides the counting relay before mentioned, resistance tubes, two lamps behind the red lens, two lamp relays, a red signal disk and fuses protecting all circuits. Lamps are provided in pairs with relay connections so that if a regular lamp burns out its mate is automatically switched into active service.

Normally the two line wires are on feed at both ends of the block by connections through the counting relays placed in the domes of each of the main signal cases. One of these wires is for the circuit operating the signals. The other is for the restoring circuit which operates to step the counting mechanism back, step by step, as cars leave the block at the exit end.

When a car runs under the setting switch it charges a wire which operates the counting mechanism, disconnects the signal circuit from its feed at that end and connects it



Yonkers Signal Installation—Street Layout and Wiring Diagram

place simultaneously. The danger signals will remain unchanged until all cars have left the block. The last car out restores the signal to normal condition.

Operation is effected by charging wires from the trolley which operate a counting mechanism located in the top of the main signal case. When the trolley wheel of the car strikes a projection on the trolley switch connection is made between the trolley wire and the wire connecting the counting mechanism. If the car is entering a block, it runs under one of these switches, which charges a setting wire—that is, a wire connected with the counting mechanism—and rotates a wheel a short distance in a certain direction for each car entering the block. If a car leaves the block it runs under a switch which charges another wire, causing the wheel of the counting mechanism to rotate the same short distance but in the opposite direction. When as many cars leave the block as have entered, this wheel has been turned back to its normal position, and in so doing has restored the signals to their normal condition.

The first car which enters a block at either end determines that end as the entering end and the other end of

with the ground. The result of this operation is a flow of current from the signal at the other end of the block which lights one of the lamps behind the red lens, displays the red signal disk, energizes magnets to open the setting circuit at that end, continues over to the case at which the car operated the counting mechanism, through a lock magnet (which makes restoring impossible while this circuit is active), through a white light in one of the semaphore cases, energizing a magnet to display the semaphore disk, and thence to ground.

By opening the setting wire as above noted a car cannot derange the signal display by unavoidably running against a danger signal. When the cars run through a block and leave at the exit end they charge a wire leading from the restoring switch to the nearby signal, which, by energizing a magnet in the counting relay, opens the signal circuit and at the same time connects the other line wire with the ground.

By opening the signal circuit the lock magnet at the entering end is de-energized and the restoring circuit is established as above noted by putting it on the ground. The restoring circuit operates a magnet which turns the step or

counting wheel in the direction contrary to that caused by the setting operation. Restoration takes place in a similar way when a car backs out of the block at the end in which it entered.

Cars following one another into a block change the semaphore signal display from side to side alternately by operating to rotate the step wheel in the counting relay, which switches the signal circuit first into one semaphore mechanism for one car and then into the other for the following car.

The whole arrangement of circuits is such that outside influences, such as grounds, crosses, etc., affect the signal display in all cases only in such manner as insures safety in the car movements.

HIGHWAY CROSSING SIGNAL FOR ELECTRIC RAILWAY

Among the new apparatus brought out by the Nachod Signal Company, Philadelphia, Pa., is a highway crossing signal for electric railways, which is stated to embrace many of the meritorious features of that company's well-known line signals. With respect to the variety of car movements



Trolley Contactor for Highway Crossing Signal

possible, the control is practically equivalent to that given by a track circuit, and very much more elaborate in that regard than the ordinary crossing signal operated by intermittent contacts.

The signal is started by a car passing a contact device, located, say, 1000 ft. from the crossing, and is stopped by a similar contactor at the crossing. For a single-track crossing another contactor is located at an equal distance in the opposite direction to start the signal for cars going the other way. The indication is given simultaneously by a vibrating bell and by a flashing illuminated danger sign. If two or more cars pass the starting contactor the bell will continue to ring until both or all have made the crossing, or if a car should start the bell ringing and should back under the contactor without making the crossing it will stop it. Thus cars may run through the protected section in any manner, making all kinds of abnormal movements, but so long as one remains between the starting contactor and the highway crossing the bell will continue to ring. In fact, the control embodies the directional and car-counting features of Nachod signals.

The trolley contactors of the type illustrated are without moving parts and operate at high speeds. They are fixed to the wire by the usual trolley ears and are supported by a double curve pull-off at one end. The wheel bridges from the wire to the contact strips, which are inclined toward each other. Therefore the one adjustment of the strips will accommodate a variety of trolley wheels.

The standard, which is illustrated in the accompanying cut, consists of a pinnacle, sign, fuse box and base, with pipe connections, the base being secured with foundation bolts to a concrete pedestal. The fuse and control box affords a convenient means of testing the circuits of the bell and also for stopping it manually in emergencies. No batteries are required for the bell, as both the controlling and ringing circuits are supplied from the trolley.



Crossing Signal

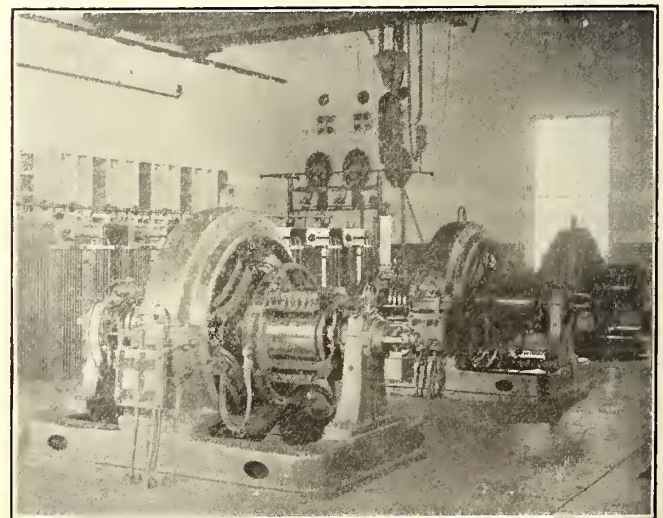
The bell is an 11-in. cast bell-metal gong, attached to the door of the cast-iron case. The clapper strikes the gong through a small hole in the case, thus making a thoroughly weatherproof construction. The relay, which comprises a clapper magnet and a pair of counting magnets operating a revolving switch in the manner of a drum controller, is in the lower part and is immersed in a tank of transformer oil. This lubricates the moving parts, quenches the arc of the contacts, protects against lightning damage, in general increasing the reliability of the bell and reducing maintenance. The scheme of circuits is said to be remarkably simple for so universal a control.

The danger sign is a cast-iron box having the word "Danger" in 6-in. letters deeply recessed, glazed with wire glass, in which are a series of lights flashing in unison with the bell. This is a new form of warning and is particularly arrestive at night. The ringing indicator furnished consists of a shaded light signal located immediately in advance of the starting contactor and illuminated by one of the series of flashing lamps which is run to it. Thus a motorman who passes the contactor will be assured by observing this that he has started the signal in operation. This improvement should be welcomed, as most crossing signals give no proof that the apparatus is in operative condition and that the signal has been given.

The light and bell signals are independent, and the burning out of lights will not affect the bell. The equipment for single track comprises one standard complete, including sign and bell, three trolley contactors and two ringing indicators. For double track the equipment comprises one standard, four trolley contactors and two ringing indicators. In a residential district or other locality where the bell might be objectionable the flashing lights alone can be furnished. On the other hand, the bell can be used without the lights.

ROTARY CONVERTER OPERATION FROM SINGLE-PHASE RAILWAY POWER STATION

The operation of a three-phase rotary converter railway system from a power house used primarily to supply single-



Interior of Stamford Substation, Showing Converters, Transformers and Lightning Protective Apparatus

phase current for the operation of a trunk-line railroad is a problem which presents several unusual considerations.

The Stamford substation of the Connecticut Company is one of three rotary converter substations now installed which are designed for operation from the three-phase,

11,000-volt, 25-cycle circuit fed from the Cos Cob power station of the New York, New Haven & Hartford Railroad. The other two are the Port Chester substation of the New York & Stamford Railway, with a capacity of 1500 kw, and the White Plains substation of the Westchester Street Railroad, with a capacity of 1200 kw. The Stamford substation contains three rotary converters rated at 300 kw each, and it is equipped with the usual transformers and a suitable three-phase reactance, all of Westinghouse construction.

In laying out this station a number of problems had to be considered. The resistance of the line between Stamford and Cos Cob was very low, the distance being only $3\frac{1}{2}$ miles, and the unbalancing of voltage due to the single-phase railroad system was considerable as well as very fluctuating. For the same reason surges of voltage were often encountered, and it was necessary to consider the conditions which would exist when one leg of the transmission line was opened on account of line trouble on the leg supplying single-phase current to the trunk-line railroad.

By providing sufficient taps on the 11,000-volt side of the transformers it was found possible to reduce the maximum unbalancing of the line, so far as the rotary converters themselves were concerned, to a value somewhere about one-half that on the primary circuit, and this arrangement, together with the reactance coils and the liberal design of the rotary converters, has given very good results. In order to take care of the single-phase condition resulting from the opening of one leg of the transmission system, the specifications called for an equipment which would disconnect one leg and for rotaries which would be capable of carrying full load for five minutes when supplied with single-phase energy. The ability of the machine to do this has been amply demonstrated, there being only a slight momentary, and by no means objectionable, sparking when one leg is opened under conditions of full direct-current load. The disconnection of any one leg is obtained by the use of three single-pole, electrically operated oil circuit-breakers on the incoming line, and by means of under-voltage relays controlling the breakers in the power and trolley circuits respectively.

The incoming three-phase 11,000-volt line is controlled

tion is afforded by a specially designed electrolytic arrester.

After being in service a period over a year, it does not appear that there is any difficulty in obtaining successful operation with a rotary converter substation feeding a railway load when supplied with three-phase power from a single-phase railway power station.

CENTER-ENTRANCE TRAIL CARS FOR MEMPHIS

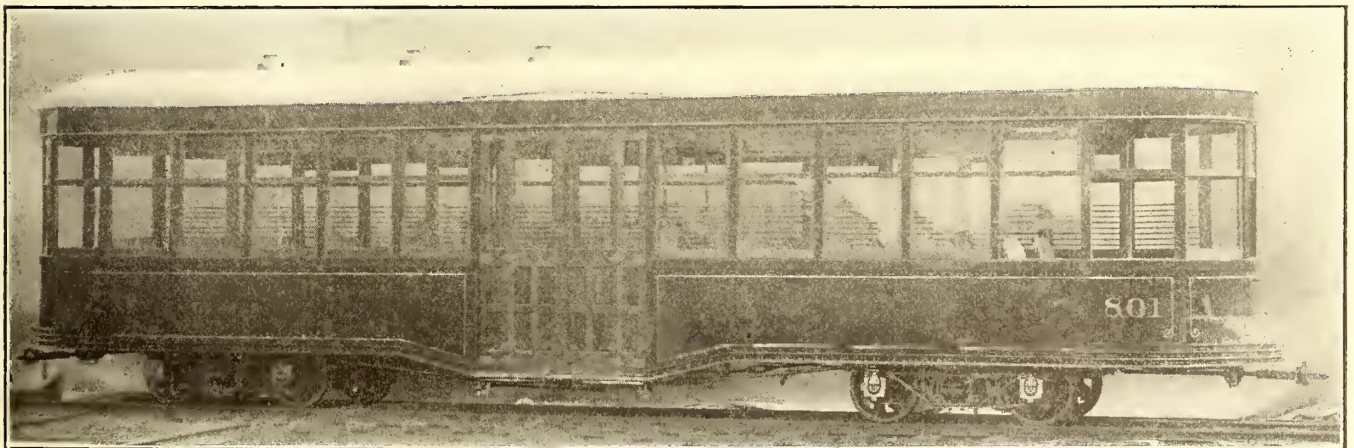
The Memphis Street Railway has recently placed in service fifteen trail cars with low floors and center entrances. The cars are intended for single-end operation and for that



Memphis Trailer—Interior View, Showing Railings at Center

reason entrance doors are provided only on one side of the car, the side opposite the door being equipped with a short longitudinal seat.

The bottom framing is of steel with side sills of 7-in. T-beams. The end sills and four cross-beams are 4-in. T-beams, two $1\frac{1}{2}$ -in. truss rods being placed under the side sills. The sides are straight and are sheathed with white



Memphis Trailer—View Showing Center Door and Drop Siding to Provide for Interior Step

by single-pole, outdoor-type electrically operated oil circuit-breakers similar to those used on the bridges of the electrified portions of the New York, New Haven & Hartford Railroad, but they are set at a rather high tripping point, so that under normal conditions the station is handled and overload protection afforded by electrically operated oil circuit-breakers mounted in the busbar structure in the building. These are operated and tripped from power supplied by a storage battery in the station. Lightning protec-

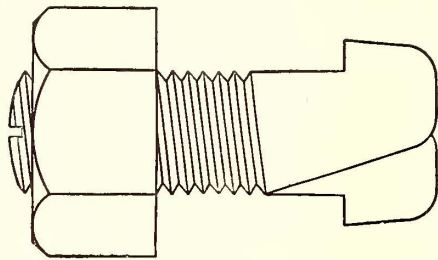
ash and an exterior sheathing of No. 12 gage steel is installed below the window sills. Both the upper and the lower window rails are made in one piece and they are screwed and dovetailed into the side and corner posts.

The wheels are only 24 in. in diameter, thus permitting a floor $28\frac{1}{2}$ in. above the top of the rail. This floor is reached in two steps, the first with a $14\frac{1}{2}$ -in. and the second with a 14-in. riser. The latter step is of the interior type and, as shown in the accompanying illustration, the side sheathing

is dropped at the doorway to support it. The center entrance is 5 ft. 3 in. wide. The length of the car over the vestibules is 38 ft. 3/4 in. and the seating capacity is fifty-four. Cross-seats are used throughout, except at the semi-circular ends and at a point opposite the entrance. The lower window sashes can be raised up to the level of the stationary upper ones, thus making the car suitable for both winter and summer use. A plain arched roof is installed in connection with Brill ventilators, which are located along the center line.

SPLIT BOLT FOR USE IN INACCESSIBLE PLACES

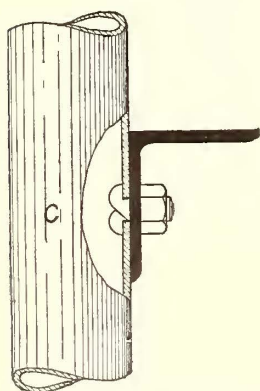
A new device called the Kling bolt has been designed for attaching brackets to tubes or drums or in places where insufficient space exists for inserting bolts of the standard type. It permits the head to pass through a hole of the same diameter as the stem of the bolt and yet gives a firm anchorage for the head on the opposite side of the material through which it passes. In consequence it is well adapted to all hollow construction work.



Split Bolt—Side View Showing Shape of Half Heads

The device is a split bolt, each half having a head of special shape, the split being made in order that the bolt head may be passed through the hole. This splitting does not reduce the area of the metal nor affect the tensile strength of the bolt, as the area of the metal at the head is greater than the area of the metal where the thread is cut. The heading of the bolt does not injure the fiber of the metal in any way.

The new bolts are made both with plain heads and with braced heads, the braced head bolts being designed for use where heavy strains occur. The accompanying illustration indicates how readily brackets may be attached to tubing with these bolts, and this is also the case with swivels, loops, attachments for guy wires, etc. In addition the bolt offers many advantages where connecting or bracing is necessary in the construction of railings. Where gates are required



Split Bolt—Bracket Attached to Tube—Sash and Curtain Guide Attached to Side Post

their hinges may be securely attached to the railing by means of this device, and it is possible to attach fittings of various design to both round and square columns. In all

cases the bolts will save the cutting or threading of pipe or tube.

A broad field for the use of this bolt is that of steel and semi-steel passenger car construction, as it permits the use of tubular posts. The illustration shows sash and curtain guides attached to a tubular post with the Kling bolt. Where space is limited, a single curtain guide can be used as shown on this section. Composition wood or steel lining can also be readily attached to posts and carlines. The new bolt is the invention of Peter M. Kling, of the Brooklyn Rapid Transit Company, and it is being placed on the market by the United States Metal & Manufacturing Company, New York.

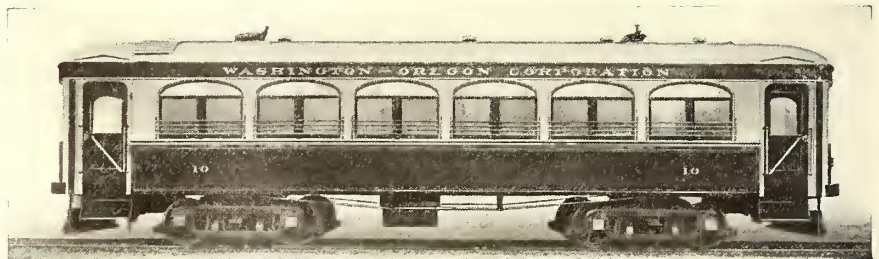
CAR FOR COMBINED CITY AND LIGHT INTER-URBAN SERVICE

The accompanying halftone shows the exterior of a car of unusually handsome lines which was recently built by the Niles Car & Manufacturing Company for the Washington-Oregon Corporation of Portland, Ore., and Vancouver, Wash. The car is of standard construction in all details, with single arch roof, single side walls, with steel outside sheathing and an extremely wide aisle. It is designed for double-end service and has passenger and smoking compartments. It is intended for city, suburban and light inter-urban traffic in Oregon and Washington, as it can be operated at speeds up to 45 m.p.h. as a maximum.

The general dimensions are as follows:

Length over buffers.....	47 ft. 0 in.
Length of car body.....	35 ft. 0 in.
Width over outside sheathing.....	8 ft. 9 1/2 in.
Width of aisle.....	29 1/4 in.
Length of seats over aisle arm rests.....	37 in.

Each end of the car body and each side of each platform is fitted with a 30-in. single door. The side walls below the



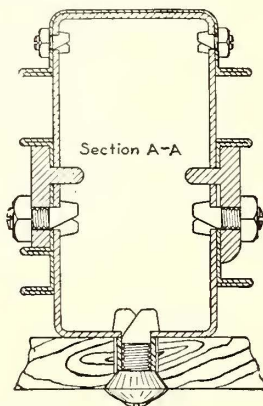
Car of Washington-Oregon Corporation for Combined City and Light Inter-urban Service

windows are of 1-in. tongued and grooved oak, sheathed on outside with No. 12 gage patent bevel steel plates.

WATER-POWER FOR THE TWIN CITIES

Active construction work has been commenced on the Coon Creek Rapids development in the Mississippi River, 11 miles northeast of Minneapolis, where a 12,000-hp plant is to be erected by H. M. Bylesby & Company, to furnish additional power to their Minneapolis and St. Paul properties. The dam is being built under a fifty-year permit granted by the United States government, which requires that the army engineers supervise the design, construction and operation of the development. The dam will consist of an earth embankment with core walls 600 ft. long, a power house and a retaining section 470 ft. long.

The first installation in the power house will aggregate 12,000 hp, transmitting to Minneapolis at 13,300 volts, thus tying in directly without transformers with the general distribution system of the Minneapolis General Electric Company at its Riverside steam plant. The transmission line to Minneapolis will be erected for part of the distance on private right-of-way and partly alongside the new tracks of the Minneapolis & Northern Railroad.



News of Electric Railways

Report of the District Electric Railway Commission, Washington

The fifth annual report of the District Electric Railway Commission, Washington, D. C., for the year ended Dec. 31, 1912, as submitted to the Interstate Commerce Commission, was made public on Feb. 10, 1913. During the year the District Electric Railway Commission held thirty-seven executive sessions and eight public sessions. One hundred and six complaints were received during the year. Of these complaints ninety-four were disposed of by the direct informal action of the commission or by the Interstate Commerce Commission after recommendation by the District Electric Railway Commission. A considerable part of the report is necessarily taken up with matters of purely local interest, such as service over particular lines, the operation of "owl" cars, etc. An abstract follows of the parts of the report which deal with the subjects of crowding, trailers, new and improved equipment, transfers, all-night service, ventilation, etc.:

"The largest question which the commission has had to deal with has been that of providing a sufficient number of cars to handle the traffic properly during the rush hours of the day. A study of the situation has been made by taking records of the number of passengers carried and the number and capacity of cars furnished on the various lines. On the basis of these records orders have been issued from time to time requiring the operation of an increased number of cars so as to relieve the conditions somewhat. The Washington Railway & Electric Company was seriously handicapped during the year by the destruction of forty-five passenger cars by fire. The company finally placed orders for sixty-five new cars. Delays in the arrival of these new cars made it impossible for the company to place enough cars in service to handle the passenger traffic without overcrowding. In this connection investigation by this commission has shown the necessity of action whereby the street railways will be required to have on hand a sufficient number of surplus cars properly to meet the increasing demands of traffic.

"Previous reports have emphasized the fact that the maximum number of cars which can be efficiently operated on certain lines in the District had been nearly—if not quite—reached during the daily periods of heaviest traffic. The commission repeats its suggestion that there should be legislation requiring the construction of additional tracks in order that a sufficient number of cars may be operated to accommodate the continually increasing traffic.

"Owing to the loss by fire of a large number of cars of the Washington Railway & Electric Company, as heretofore mentioned, and the subsequent delay in the delivery of new cars to replace those destroyed, the order of the commission prohibiting the operation of single-truck trailers was amended and will finally become effective Feb. 1, 1913. The Washington Railway & Electric Company is now operating about twenty single-truck trailers, which constitute the entire amount of equipment of this character now in service in the District. The Capital Traction Company ceased operating trailers on May 15, 1912.

"The Capital Traction Company has received its full complement of 150 new city cars of the pay-within type, all of which are now in service, and in addition has remodeled a number of its old cars to conform to this type. Five additional suburban pay-within cars have also been placed in service on the Chevy Chase line operated by this company. These pay-within cars are suitable for both summer and winter use, and experience shows that when these cars are properly heated and ventilated they are excellent equipment for winter use.

"The Capital Traction Company decided during the past year to equip all of its cars with air brakes and will have the work completed not later than Jan. 1, 1914.

"During the year the Washington Railway & Electric Company has placed in service fifty new fourteen-bench cars, has practically rebuilt twelve suburban cars operated on the Tenleytown line, equipping them with new trucks, four motors in place of two, new seats, etc., and has con-

verted several cars from the pay-as-you-enter to the pay-within type, installing air brakes and cross-seats in the place of longitudinal seats in the latter. This company has also placed in service about thirty new cars of the center-entrance type, these being a part of an order of sixty-five new cars of the same design, all of which are expected to be in service in the course of a few weeks. These cars are all equipped with air brakes, are adapted to both summer and winter service and have several additional features which are conducive to increased comfort and convenience. The Washington & Old Dominion Railway has placed in service a number of new cars of the interurban type in connection with its extended service to Bluemont, Va. The Washington, Spa Spring & Greta Railroad has in service two cars operated by storage batteries.

"This commission favors legislation giving to the Interstate Commerce Commission or to the public utilities commission, if such is to be provided, power to determine the points at which and the conditions on which transfers shall be issued within the District of Columbia. It is believed that this situation can be better handled administratively than by the incorporation of transfer arrangements in a statute.

"After extended investigation and hearing in regard to the operation of all-night cars through certain sections of the city not provided with such service, it was decided that an all-night service was reasonable and should be required. Orders were accordingly entered requiring a minimum service over certain lines with very satisfactory results to the patrons of these lines. The Washington Railway & Electric Company has protested to the commission against being required to furnish this all-night service, claiming that it does not pay the operating expense, but the Interstate Commerce Commission has declined to withdraw its order.

"The establishment of express service on several lines extending into the suburban sections of the District has resulted in a more proper distribution of passengers between city and suburban cars running over a portion of the same route, and the inauguration of similar service on other lines is now under consideration.

"The investigation into the question of the impure air in cars has been continued through the year. The modern car with both platforms inclosed by doors which are closed while the car is moving, while it presents many advantages which have led to its almost universal adoption, is unquestionably deficient in the matter of pure air. There are not more than six or seven cars in service within the District of Columbia which are equipped with automatic ventilators. The sixty-five new cars now being placed in service by the Washington Railway & Electric Company are equipped with a mechanically operated ventilating device. The necessity for proper ventilating devices is plainly shown by the investigation made by the health officer of the District of Columbia at the instance of this commission, the details of which will be embodied in a separate report on car ventilation which will be submitted at a future date. In the meantime it is believed that every closed car should be automatically ventilated in order that passengers may be relieved from the dangers of vitiated and poisonous air."

Bigelow Bill Discussed at Cincinnati

Mayor Henry T. Hunt of Cincinnati, City Solicitor Bettman, representatives of civic and labor organizations of Cincinnati and other interests appeared before the judiciary committee of the House of Representatives on Feb. 4 to discuss the Bigelow bill, which seeks to repeal all franchises which were made for a period of more than twenty-five years. This bill can be applied only to the Cincinnati Traction Company and underlying corporations, since no other city took advantage of the Rodgers law during its short life. Mayor Hunt opposed the Bigelow bill because it interferes with the plans of the administration for settling the street railway differences in Cincinnati. He has proposed that the Cincinnati Traction Company shall give up its fifty-year franchise and accept one for an indefinite term or one that

can be terminated at the option of the city. The company should rent the loop when constructed at a sum equal to the interest and sinking fund on the cost of construction, plus taxes. Interurban roads should be permitted to use the loop at not more than 25 cents per car mile. A commission should be selected to determine the propriety of stock issues, extensions and fares, the company to be permitted to earn enough to pay a fair return on the capital invested. Any additional profits should be divided equally between the city and the company. Mayor Hunt then asked the enactment of legislation as follows:

Authority for a bond issue for a terminal loop to be submitted to the voters, two-thirds of the votes cast being required to carry it.

Grant of an additional stretch of the canal about three-quarters of a mile in length to Ross Avenue in St. Bernard to enable the city to develop the loop project.

Relief from the word "beneath" in the original canal act, apparently requiring subway construction to a point beyond the necessity of public convenience.

A law converting term franchises into indeterminate franchises with proper provision for valuations and appraisals.

A law permitting a city and a company in possession of a term franchise to agree upon terms of surrender of franchises when approved by popular vote.

City Solicitor Bettman outlined the objectionable features of the Bigelow bill. He said its greatest fault was that improvements and extensions could not be financed under it. No provisions had been made for the reconstruction of the work that would be torn down. Mr. Bettman offered a bill which follows the Wisconsin plan. He believes that it cares for all the exigencies that may arise and provides for financing upon a fair basis.

Miller Outcalt, attorney for the Cincinnati Street Railway, operated under lease by the Cincinnati Traction Company, said that the enactment of the Bigelow bill into a law would be followed by a long legal struggle. The company which he represented wanted to see the contract with the lessee enforced, but it would oppose any measure that threatened to disturb its financial status or its contracts with the Cincinnati Traction Company.

Representative Bigelow said that he did not mean that the bill should be devoid of constructive features, but that the inclusion of some of the points named by speakers would make it weak and perhaps unconstitutional. The constructive ideas could be taken up later, when the city would have more power to enforce its demands.

A public meeting was held at the Music Hall, Cincinnati, on the evening of Feb. 5, at which Mayor Hunt, City Solicitor Bettman and Representative Bigelow discussed the bill. Theodore Horstman, who presided, condemned the fifty-year franchise and criticised the company on the ground that it had furnished inadequate service. He also stated that the amount of stock which is outstanding is excessive. Mr. Horstman said that the proposed loop around the city would benefit the company.

New York Rapid Transit Operating Contract Injunction

Edward E. McCall, formerly Justice of the Supreme Court of the State of New York, who was appointed a member of the Public Service Commission for the First District by Governor Sulzer on Feb. 3, 1913, took possession of his new office on the afternoon of Feb. 7, 1913, when he succeeded William R. Willcox as chairman of that commission. Mr. Willcox has served as chairman from the date of the organization of the commission in 1907, when he was appointed and designated as chairman by Governor Hughes. His colleagues at that time were William McCarroll, Edward M. Bassett, Milo R. Maltbie and John E. Eustis. Governor Hughes reappointed Commissioners Maltbie and Eustis when their terms expired, and they are still members of the commission. Commissioners McCarroll and Bassett retired during the administration of Governor Dix, who appointed as their successors respectively J. Sergeant Cram and George V. S. Williams. Chairman Willcox's term expired on Feb. 1, 1913, and Governor Sulzer appointed Judge McCall as his successor and also designated him to act as chairman. The commission as it now stands, therefore, consists of Edward E. McCall, chairman; Milo R. Maltbie, John E. Eustis, J. Sergeant Cram and George V. S. Williams.

The operating contracts with the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company were not signed before Chairman Willcox went out of office. Action probably would have been taken on these contracts if it had not been for an injunction obtained by John J. Hopper restraining the commission from executing them. The injunction was vacated on Feb. 11, 1913, Presiding Justice Ingraham declaring that the points raised were without merit. The injunction was applied for on the ground that the carrying out of the terms of the proposed contracts would involve a waste of public funds.

Notwithstanding the delay as to the operating contracts, the commission has gone ahead with actual construction work. During the week two contracts were awarded for the construction of the Astoria and Corona branches of the proposed rapid transit system in Queens Borough. These branches run from the Queens end of the Queensboro Bridge, one north to Astoria and the other eastwardly to Corona and Flushing. The contracts awarded cover the greater part of these two routes, although the section covering the junction and embracing the joint station near the Queens end of the Queensboro Bridge has not yet been advertised for bids. Both contracts were awarded to the lowest bidders, the Astoria line going to Cooper & Evans for \$860,743 and the Corona line to the E. E. Smith Contracting Company for \$2,063,588. Both will be elevated railroads, and under the proposed dual system are to be operated jointly by the Interborough Rapid Transit Company and the New York Municipal Railway Corporation.

The commission has approved a contract made by the Brooklyn Heights Railroad and the New York Municipal Railway Corporation for the construction and operation by the latter of an elevated connection between the Myrtle Avenue elevated line in Brooklyn and the Lutheran Cemetery line, so that under the new rapid transit system trains on the Myrtle Avenue line may be operated continuously over the Lutheran Cemetery line from Wyckoff Avenue to Metropolitan Avenue and return.

The commission has transmitted to the Board of Estimate and Apportionment resolutions laying out two new rapid transit routes needed for the dual system. One is known as the Park Avenue-Lexington Avenue connection at Forty-second Street, Manhattan, and provides for the connection of the existing subway with the new Lexington Avenue subway. The other is known as the Flushing route and provides for the extension of the Woodside, Astoria and Corona route in Queens from its present terminus at Prime Street, Flushing, through Roosevelt Avenue, Amity Street, Marston Avenue, Lucerne Place, Station Road and Warburton Avenue to Bay Side Boulevard. This route will bring the district in and around Flushing and Bayside into all-rail communication with Manhattan.

The Question of Deficits in the Operating and Maintenance Funds in Cleveland

A meeting of the officers of the Cleveland (Ohio) Railway and city officials was held in the office of J. J. Stanley, president of the company, on Feb. 5, 1913, for the purpose of formulating a plan to wipe out the deficits in the operating and maintenance funds. Mayor Newton D. Baker, Street Railway Commissioner Peter Witt, Engineer Joseph Alexander and Thomas Sidlo, secretary to Mr. Witt, represented the city, while Mr. Stanley, Secretary Henry J. Davies, General Manager George Radcliffe, Auditor Thomas Kilfoyle and Attorney Harry Crawford were present for the company.

The representatives of the city asked that the surplus in the accident fund be transferred to the other funds in order to balance them and argued that if this was done there would be no need to increase the fare. Mr. Stanley feels that the funds should be administered just as intended in the Tayler franchise. An increase in the fare would be necessary to prevent further deficits in the funds and pay off those already made. Mayor Baker said he believed that the Tayler franchise did not contemplate a deficit of any kind and intimated that so long as there are funds in the treasury there will be no deficit. Mr. Witt and Mr. Davies will submit their views in writing for the consideration of the city officials. The franchise provides for arbitration in case of disagreement.

Mayor Baker, Mr. Witt and Councilman Haserodt, chairman of the Council committee on street railways, inspected the property of the company recently and as a result decided to approve the request of the company to expend \$500,000 for track repair this year.

At a meeting of the street railway committee of the Cleveland Chamber of Commerce recently, the subject of service was discussed. Mr. Stanley and Commissioner Witt said the service is not what it should be, but that it will be improved as soon as the trailers and motor cars ordered some time ago are received and placed in operation. Mr. Witt's request that mercantile houses and factories dismiss their employees at different times between 4.30 p. m. and 5.30 p. m. was discussed, and it is said that the committee later decided to advise employers to do this if possible.

Subsidy Urged for Toronto, Uxbridge & Port Perry Railway

A deputation from Toronto, Ont., and surrounding municipalities asked the Premier and Minister of Railways on Feb. 6 for a subsidy of \$455,000, or \$6,500 a mile, toward the construction of the proposed Toronto, Uxbridge & Port Perry Railway. The total cost of construction is estimated at \$1,500,000 for the 70 miles of line, or between \$20,000 and \$25,000 a mile. Mayor Hocken of Toronto urged the necessity for proper radial facilities between the city and surrounding municipalities. He explained that the line would be constructed by the municipalities interested on a private right-of-way. Adam Beck, explaining that he was not appearing as the representative of the Ontario government, outlined the steps leading up to the recent conference in Toronto on radial railways. The opinion seemed to be that the Hydro-Electric Commission should finance the power end. Mr. Beck said:

"It is admitted that the steam railroads do not serve the agricultural communities. We want facilities to bring the mixed farm products to leading centers. A continuous service from rural districts to the city can be operated economically only by electricity."

Premier Borden said:

"We will give our most attentive consideration to the representations put before us. So far as the purpose you have in mind is concerned, we recognize its importance. We also recognize the importance of giving the tiller of the soil adequate transportation facilities. You will recognize, however, that subjects of very potent consideration are involved. This is not the first application for a charter of this kind that we have had, and you will realize that if we embark on a policy of federal aid to local undertakings we shall be opening up a pretty wide question. Our resources are limited, but we shall be very glad to receive your representations in written form and to give them careful consideration."

Compulsory Adoption of Block Signals Recommended

The Block Signal and Train Control Board, which was created by Congress in 1907, made its final report to the Interstate Commerce Commission on Feb. 8, 1913. The most important recommendation of the board is for the compulsory adoption of the block signal system by all interstate railroads. Special attention was paid to the devices which have been developed to stop trains automatically. In this connection the Block Signal and Train Control Board says in part:

"The development of the automatic train stop has proceeded far enough to warrant the expectation that by its use greater safety can be secured in the operation of trains. Railroads should be given to understand that the automatic train stop must be developed by them as rapidly as possible."

The board also recommends that railroad tracks be properly inclosed and laws against trespassing be enforced. It also says there should be more complete co-operation of the state and federal governments on the one hand and the railroads on the other to bring about more stable conditions throughout the country. Piecemeal legislation should be brought together and harmonized into general enactments, comprehensive in character and based on the best practice, and the enforcement of this general legislation should be intrusted to a body having powers similar in character to

those possessed by the railway departments of the British Board of Trade.

The members of the Block Signal and Train Control Board are M. E. Cooley, dean of the engineering department of the University of Michigan, chairman; Azel Ames, F. G. Ewald, B. B. Adams and W. P. Borland, secretary.

Western Massachusetts Electric Railway Situation

During a recent visit to Springfield, Mass., L. S. Storrs, vice-president in charge of the Connecticut electric railway properties of the New York, New Haven & Hartford Railroad, stated in an interview that the company's interest in electric railway development in western Massachusetts continues unabated, and that the New York, New Haven & Hartford Railroad organization stands ready to expend \$5,000,000 in extensions if the Legislature now in session passes the bill authorizing ownership of the electric railway system centering in Worcester and Springfield and known as the New England Investment & Security Company's lines. Mr. Storrs said that he agreed with President Charles S. Mellen of the New York, New Haven & Hartford Railroad that the State, through properly delegated authority, should say where the extensions shall be built. The company desires so to operate the systems that they shall be mutually beneficial. Mr. Storrs said that the proposed legislation was needed not only on account of the demand for rural extensions in hill towns at present suffering for lack of transportation facilities, but to facilitate the raising of funds for improvements at Springfield and Worcester. A repair shop to cost between \$300,000 and \$400,000 is needed at Springfield for adequate rolling stock maintenance, and without the help of the New York, New Haven & Hartford Railroad, which cannot at present legally be given, it is difficult for the Springfield lines to raise the money.

Governor Dunne of Illinois on Public Utilities

In discussing the subject of public utilities Governor Edward F. Dunne of Illinois in his inaugural address to the Forty-eighth General Assembly of that State said in part:

"Only one utility-producing concern should be allowed that privilege for each utility in each city. That concern must be either the municipal corporation itself or a private corporation. The sole aim of a public corporation is to operate to the satisfaction of the community, which is always assured by giving the best service at the lowest rate. The sole aim of all private corporations, unregulated by law, is to make money for their stockholders, and the most money can be made by poor service at a high rate to the consumer. The only question, then, is whether the public shall own and operate through state or local agencies, or whether it shall allow these utilities to remain in the ownership and control of private corporations and regulate them by law.

"After a careful investigation, the committee on municipal versus private operation of public utilities appointed in 1906 by the National Civic Federation held the right of municipal ownership to be more important than any form of regulation.

"While most cities of Illinois may not be ready as yet to undertake municipal operation of other than waterworks, legislation should be enacted immediately giving all cities the right to build or buy and to operate their utilities. For this purpose, cities should be empowered to issue bonds, subject to a referendum and such other reasonable safeguards as may be necessary. If such rights are given, it will force private corporations now furnishing these utilities to give decent service at decent rates or face the alternative of public ownership.

"Important as it is to give cities the right to manage their own public utilities, it is also important to give to state and local bodies large powers of regulation of the public utilities that remain in private hands. The interurban utilities can only be regulated by the State. For that purpose, a well-equipped public utilities commission should be created with large powers. It should control the issue of securities, the character of service, the rate of charge, etc. It should be appointed by the executive with the approval of the Senate. With respect to intraurban, or strictly city utilities, it might be well, at the start, to give to the proposed

State commission control of the city utilities when requested by any of the several cities of the State. The commission, however, should be empowered to secure uniformity of accounting and full publicity with respect even to the city utilities, and should be prepared to furnish this information in tabulated form in its annual reports, and in further detail to public officials. It would also be well to give the State commission full control of all new issues of stocks, bonds and notes and other evidences of indebtedness of all the public utilities of the State, including those within the cities.

"To Chicago and all cities over 100,000 population might be given the right, enjoyed by the city of St. Louis, of creating its own commission, which would report directly to the City Council and have such powers and resources as may be conferred upon it by the city itself."

Pittsburgh Subway Ordinances.—The subway ordinance was passed finally by the City Council of Pittsburgh on Feb. 4, 1913.

Double-Deck Car for Washington.—The Washington Railway & Electric Company, Washington, D. C., has ordered a double-deck car from the Southern Car Company, High Point, N. C.

Earnings of the Geary Street Municipal Railway.—The gross receipts of the Geary Street Municipal Railway, San Francisco, Cal., for January, 1913, the first full month of operation, are reported unofficially to have been \$17,465, and the surplus after the payment of all operating expenses and interest on the bonds is said to have been \$415.

Appraisal of Seattle, Renton & Southern Railway Ordered.—Scott Calhoun and Joseph Parkin, receivers of the Seattle, Renton & Southern Railway, Seattle, Wash., have been authorized by the court to employ experts to appraise the property of the company. The city of Seattle has commenced condemnation proceedings for the acquisition of 10 miles of the 14 miles of railroad operated by the company, the intention of the city being to use the condemned property as part of a municipal line if the condemnation proceedings are successful.

Key Route Pier Contract Awarded.—The San Francisco, Oakland & San José Terminal Railway, Oakland, Cal., the Key Route, has awarded a contract to Twohy Brothers for the filling in of the Key Route pier at a cost approximating \$2,000,000. Work is to be started immediately, and while the contractors fill in the pier they will increase the number of tracks from two to eight. While the Key Route's plans for the enlargement of its terminal facilities at Oakland provide for an immediate expenditure of \$2,000,000, the improvement work will ultimately cost in the neighborhood of \$7,000,000, the latter sum covering the cost of erecting new and more extensive train sheds.

Conference on Block Signals in Indiana.—The Railroad Commission of Indiana has announced that a hearing will be held before the commission at Indianapolis on Feb. 20, 1913, at which means will be discussed for expediting the work of equipping the electric railways in Indiana with block signals in accordance with the recommendations of the commission. It is said that the companies furnishing the equipment will be unable to supply sufficient material for the railways to comply with the order of the commission within the time specified except at prices which will include compensation for the changes which will be necessary in their organizations in order to anticipate the time limit.

New Pennsylvania Line Placed in Operation.—The Lebanon & Campbellstown Street Railway has been placed in operation between Lebanon and Campbellstown. It is intended to operate this railway and the Hummelstown & Hershey Electric Railway, both owned by M. S. Hershey and his associates, under the name of the Hershey Transit Company. The completion of the new line gives electric railway communication between Newville, Cumberland County, and Myerstown, Lebanon County, via Harrisburg and Lebanon, a distance of about 70 miles. It is more than likely that in a short time it will be possible to travel by electric railway from Chambersburg to Philadelphia, via Harrisburg, Lebanon and Reading. The distance over this route would be about 170 miles.

Jurisdiction of Quebec Commission Questioned.—The Montreal (Que.) Tramways has questioned the jurisdiction of the Quebec Public Utilities Commission in relation to an inquiry proposed to be made into the affairs of the company. At a hearing before the commission the company objected that the orders were *ultra vires*. Counsel for the company said that at one time the company was willing to help the work of investigation as a means to improving its relations with the city, but that the attitude of the commission and the newspapers had influenced the company not to tolerate impositions. In brief, it was contended that the contracts between the company and the municipalities cover all points which might arise and that the commission was without jurisdiction. Judgment was reserved.

Increase in Fare on Hull Suburban Lines.—In the recent award by a board of conciliation which considered the differences between the Hull (Que.) Electric Railway and its employees in regard to wages, the board made the following recommendation: "The members of the board are of the opinion that in view of the proposed increase of wages and considering the financial condition of the company, as shown by its annual statement and the evidence given before the board, the company would be justified in increasing its charges for fares." The company has since announced a number of changes. The fare to a section having an average distance of 5 miles from Ottawa has been increased from 5 cents to 6¼ cents, four tickets for 25 cents. The fare to a section having an average distance of 8 miles from Ottawa has been increased from 6¼ cents to 8 1/3 cents, three tickets for 25 cents. The city fares remain unchanged.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

CONNECTICUT

Representative O'Keefe, of Orange, has introduced in the House a bill providing for a tax of 1 per cent on the valuation of all franchises of all the railroads in the State. It provides for the creation of a commission by the General Assembly for the valuation of all such franchises.

INDIANA

The following bills have been introduced in the Legislature recently: a bill providing that all interurban railroads operating in Indiana should place signal devices at small stations whereby would-be passengers can flag cars; a bill providing for an appeal within twenty days by a railroad from any final decision of the Indiana Railroad Commission; a bill authorizing the Indiana Railroad Commission to require flagmen on electric or motor cars in certain cases; a bill prohibiting the use of public drinking cups on the train of any common carrier which operates over a line more than 10 miles long, the companies to be required to supply sanitary drinking cups and city railroads to be exempt from the provision of the bill; a bill requiring separate compartments for motormen in interurban cars.

The Spencer "administration" public utilities measure was to be voted upon during the week ended Feb. 15, 1913. The representatives of the interurban railways have attended several meetings and have recommended amendments to the bill. They point out that the bill provides that interurban railways shall be valued by the State but that the steam railroads are not to be valued by the new commission. They charge that the bill, if it becomes a law, would seriously cripple the interurban railways of the State.

MASSACHUSETTS

The committee on railroads gave a hearing on Feb. 6 upon several bills now before the House providing for the electrification of the steam railroads within the Boston district during the next few years. Nathan Matthews, ex-Mayor of Boston, the principal speaker on behalf of the abolition of the steam locomotive, contended that the total cost of electrifying 420 miles of single track on the New York, New Haven & Hartford Railroad, the Boston & Maine Railroad and the Boston & Albany Railroad within the suburban area would be only \$15,960,000. William H. Coolidge, attorney for the New York, New Haven & Hartford Railroad, stated that the official estimate of the railroads for this work was

\$30,000,000. Mr. Coolidge said that the New York, New Haven & Hartford Railroad is not opposed to electrification and that it is proceeding steadily in the matter.

The committee on street railways has reported leave to withdraw the following bills: To require third-rails to be sectionalized at elevated railway stations, with disconnecting switches at platforms; to prohibit the use of prepayment cars; to require the Boston Elevated Railway to equip all its cars with folding platforms; to require the installation of escalators at elevated railway stations. Among bills introduced recently are the following: To require the granting of limited franchises for electric express and freight transportation; to investigate the affairs of the Boston Elevated Railway; to require all street railways in the same town to interchange transfers; to prevent overcrowding of cars; to lower street railway fares between Boston and Chelsea; to compel the running of cars on routes previously granted and to provide for state ownership of street railways.

OHIO

The Kilpatrick bill, requiring interurban cars operated more than 5 miles to be provided with toilet facilities and drinking water, has been passed by the House. A similar bill was enacted by the House two years ago but was killed in the Senate committee.

PENNSYLVANIA

Senator Beidleman has introduced a bill providing for the taxation for county, city and borough purposes of the real estate of all public service corporations, including steam and electric railways. Such property is now exempt from taxation. He has also introduced a bill providing that all cars of electric railways shall be equipped with inclosed platforms at both ends to protect the operators in cold weather. A bill has also been introduced to remedy faults in the present law forbidding the placing of obstructions on railway tracks and making the law applicable to railroads of every description.

WEST VIRGINIA

In his special message sent to the Legislature on Feb. 3, 1913, Governor William E. Glasscock recommends the creation of a public service commission to have authority over all the public service corporations which operate in the State. He also asks for a special report on the water power resources of the State. In this connection he says: "The possible water power of the rivers and streams of West Virginia is not less than 2,000,000 hp, and if the potential water power of the State is estimated to be 2,000,000 hp and it was converted into electric current, it would mean practically 1,500,000 kw, which, used 300 days in the year at 1 cent as an average rate per kilowatt-hour, would have a total annual value of \$130,000,000."

WISCONSIN

A bill has been introduced in the Wisconsin Legislature prohibiting the Railroad Commission from raising the fares on street and interurban railways above the fare stipulated in the franchise contract without the consent of the party granting such franchise, as expressed by the people of the municipality affected. The selling of tickets on street cars and interurban cars is also made compulsory.

PROGRAMS OF ASSOCIATION MEETINGS

Society for Electrical Development, Inc.

The board of directors of the Society for Electrical Development, Inc., has announced a meeting for March 4 and 5, 1913, in the Engineering Societies Building, New York, N. Y., to which the entire electrical fraternity, as well as the general magazine men, advertising agencies, etc., are invited. The object of the meeting is to obtain from as many angles as possible the ideas of the many branches of the industry on the tentative plans that will be proposed in a program that will include papers and suggestions invited from or promised by such men as Henry L. Doherty, Joseph B. McCall, Dr. Talcott Williams, T. Commerford Martin, F. H. Gale, Reginald Pelham Bolton, George Harvey, William D. McJunkin, J. M. Wakeman, Hugh Chalmers, W. E. Robertson, A. W. Burchard, L. A. Osborne, J. C. McQuiston and others. A broad educational general magazine and

class paper advertising campaign will be suggested, together with plans for a comprehensive press bureau for the dissemination of news matter pertaining to things electrical and also a field department for co-operative and general educational work throughout the electrical and allied industries. A complete program of the conference will be announced later.

The board of directors of the society, as an organization committee, has discussed and formulated diverse concrete plans, but as the active work of the society will affect practically every individual interest in the electrical business, it was thought that only by a broad discussion of the definite policy of the many lines of effort which the society will endeavor to pursue could a plan be arrived at that would coincide with the thoughts of the many diverse but allied interests involved.

Arkansas Association of Public Utility Operators

The annual convention of the Arkansas Association of Public Utility Operators will be held at the Marion Hotel, Little Rock, Ark., on May 13, 14, 15, 1913. The following preliminary program of the papers has been arranged:

Paper, "Relation of Public Utility Companies to the Public," by J. Walter Gillette, general manager of the Fort Smith Light & Traction Company.

Paper, "Effect of Tungsten Lighting on Revenue," by A. E. Main, superintendent of the electrical department of the Hot Springs Street Railway.

Paper, "Operation of Small Water Plants," by W. C. McQuire, manager of the Arkadelphia Electric Lighting Company, and E. T. Reynolds, superintendent of the Camden Power Company.

Paper, "Operation of Small Central Stations," by W. H. Walkup, superintendent and chief engineer of the Batesville Electric Light & Power Company, and J. F. Christy, manager of the Jonesboro Water & Light Plant.

Paper, "Legislation Affecting Public Utilities," by C. J. Griffith, general manager of the Little Rock Railway & Electric Company.

Paper, "Benefits to Be Derived from the Association," by Mrs. LaSalle Stoops, manager of the Stuttgart Water & Electric Light Company.

B. C. Fowles, Pine Bluff; J. F. Christy, Jonesboro, and C. J. Griffith, Little Rock, are the members of the arrangement committee.

Central Electric Railway Association

The following program has been announced for the annual meeting of the Central Electric Railway Association which is to be held at the Washington Hotel, Indianapolis, Ind., on Feb. 27 and 28, 1913:

FEBRUARY 27, 1913

Paper, "Economy in Motor Maintenance," by J. C. Thirwall, of the railway and engineering department of the General Electric Company.

Discussion.

Paper, "The Human Factor in Fare Collection Service," by John F. Ohmer, president of the Ohmer Fare Register Company.

Discussion.

Paper, "Interline Freight," by Charles O. Sullivan, traffic manager of the Western Ohio Railway, Lima, Ohio.

Discussion.

FEBRUARY 28, 1913

Business session and reports of committees.

Paper, "Mounting of Radial Couplers," by A. L. Price, sales agent of the Ohio Brass Company, Mansfield, Ohio.

Discussion.

Annual reports of standing committees.

Annual report of the secretary-treasurer.

Annual address of the president.

Election of officers.

The present executive committee of the association will meet at the Washington Hotel on the evening of Wednesday, Feb. 26, 1913, and the new executive committee will meet immediately after the adjournment of the regular meeting of the association.

Financial and Corporate

Stock and Money Markets

February 11, 1913.

There was considerable selling pressure on the New York Stock Exchange to-day, and new low records for 1913 were made in many of the prominent issues. The railroads all sold down, New York Central selling 1/2 point below its lowest figure for 1912, and thereby established a new low point for two years. Westinghouse Electric sold down to 7 1/4. Rates in the money market to-day were: Call, 2 1/2 @ 4 1/2 per cent; sixty days, 4 @ 4 1/4 per cent; ninety days, 4 1/4 @ 4 1/2 per cent.

The Philadelphia market to-day was broad and active. Lehigh Valley Transit was very active. The sales of stock of the Philadelphia Electric Company totaled 12,885 shares to-day.

The Chicago market was broad to-day, but the volume of sales was small. The bulk of the bond transactions was in Chicago Railways 5's, City Railway 5's and Commonwealth Edison 5's.

There was very little trading in the railway issues in Boston to-day and the bond market was dull.

The Baltimore market was narrow but active to-day. The demand for bonds continues good.

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

	Feb. 5	Feb. 11
American Brake Shoe & Foundry (common).....	94 1/2	95
American Brake Shoe & Foundry (preferred).....	134 3/4	135
American Cities Company (common).....	47 1/2	47 1/2
American Cities Company (preferred).....	76 3/8	76 1/2
American Light & Traction Company (common)....	405	400
American Light & Traction Company (preferred)...	108	108 1/2
American Railways Company	39 3/4	40 3/4
Aurora, Elgin & Chicago Railroad (common).....	42 1/2	43 1/2
Aurora, Elgin & Chicago Railroad (preferred)....	86 3/4	87
Boston Elevated Railway	111 1/2	111
Boston Suburban Electric Companies (common)....	7 1/2	7 1/2
Boston Suburban Electric Companies (preferred)...	65	65
Boston & Worcester Electric Companies (common)...	7	7
Boston & Worcester Electric Companies (preferred)...	40	44
Brooklyn Rapid Transit Company.....	90 1/2	89 5/8
Capital Traction Company, Washington.....	123	123
Chicago City Railways	150	150
Chicago Elevated Railways (common).....	35	a35
Chicago Elevated Railways (preferred).....	91	91
Chicago Railways, ptcptg., ctfr. 1.....	90	93
Chicago Railways, ptcptg., ctfr. 2.....	25	25
Chicago Railways, ptcptg., ctfr. 3.....	7 1/4	7
Chicago Railways, ptcptg., ctfr. 4.....	3	3
Cincinnati Street Railway	117 1/2	a119
Cleveland Southwestern & Columbus Ry. (common)...	*5 5/8	a6
Cleveland Southwestern & Columbus Ry. (preferred)...	*33	a30
Cleveland Railway	104 3/4	104 1/2
Columbus Railway & Light Company.....	19	19
Columbus Railway (common).....	68 1/2	69
Columbus Railway (preferred)	88 1/2	a105
Denver & Northwestern Railway	*118	a117
Detroit United Railway	75	a80
General Electric Company	142	140 1/4
Georgia Railway & Electric Company (common)....	126 3/4	123
Georgia Railway & Electric Company (preferred)....	82 1/2	82 1/2
Interborough Metropolitan Company (common)....	18 1/2	18 1/2
Interborough Metropolitan Company (preferred)....	62 1/2	62 1/2
International Traction Company (common).....	*38	a42
International Traction Company (preferred).....	*99	a95
Kansas City Railway & Light Company (common)...	*18 3/4	a20
Kansas City Railway & Light Company (preferred)...	*40	a41
Lake Shore Electric Railway (common).....	9	6 1/2
Lake Shore Electric Railway (1st preferred).....	91	a91
Lake Shore Electric Railway (2d preferred).....	25 1/2	a25 1/2
Manhattan Railway	132	132 1/2
Massachusetts Electric Companies (common).....	18	17 1/2
Massachusetts Electric Companies (preferred).....	78	77 3/4
Milwaukee Electric Railway & Light Co. (preferred)...	*100	a102
Norfolk Railway & Light Company.....	*25	26
North American Company	80	79 3/8
Northern Ohio Light & Traction Company (common)...	80	80
Northern Ohio Light & Traction Company (preferred)...	100	105
Philadelphia Company, Pittsburgh (common).....	49	49
Philadelphia Company, Pittsburgh (preferred).....	42 1/2	41 1/2
Philadelphia Rapid Transit Company.....	27	27 1/2
Portland Railway, Light & Power Company.....	68 1/2	67
Public Service Corporation	116	116
Third Avenue Railway, New York.....	38	37
Toledo Railway & Light Company.....	2 1/4	a6
Twin City Rapid Transit Co., Minneapolis (common)...	105 5/8	105 1/2
Union Traction Company of Indiana (common).....	*4 1/2	4 1/2
Union Traction Company of Indiana (1st preferred)...	*81	81
Union Traction Company of Indiana (2d preferred)...	*34	34
United Rys. & Electric Company (Baltimore).....	..	24
United Rys. Inv. Company (common).....	32	27 3/4
United Rys. Inv. Company (preferred).....	59	54 3/4
Virginia Railway & Power Company (common).....	55 1/2	57
Virginia Railway & Power Company (preferred).....	92	93 3/4
Washington Ry. & Electric Company (common).....	86	86
Washington Ry. & Electric Company (preferred).....	90	90
West End Street Railway, Boston (common).....	80	81
West End Street Railway, Boston (preferred).....	96 1/2	98
Westinghouse Elec. & Mfg. Company.....	73	71 3/4
Westinghouse Elec. & Mfg. Company (1st preferred)...	117	116

*Last sale. a Asked.

ANNUAL REPORTS

Capital Traction Company

The statement of earnings of the Capital Traction Company, Washington, D. C., for the year 1912, as presented to the stockholders, follows:

Total revenue from transportation.....	\$2,252,748	
Revenue from operation other than transportation.....	12,465	
Total operating revenue.....	\$2,265,213	
Operating expenses (48.942 per cent of operating revenue)...	1,098,656	
Net operating revenue.....	\$1,166,557	
Miscellaneous income	13,317	
Gross income less operating expenses.....	\$1,179,874	
Deductions from income:		
Taxes	\$130,967	
Interest	281,781	
		412,748
Net income		\$767,126
Disposition of net income:		
Dividends		720,000
Surplus for year.....		\$47,126
Surplus at beginning of year.....		80,446
		\$127,572
Profit and loss adjustments during year:		
Debits:		
Set aside for depreciation.....	\$55,000	
Uncollectible accounts charged off.....	18	
		\$55,018
Credits:		
Materials and supplies adjustments.....	\$415	
Adjustment between road and equipment and operating account of charges in previous years	5,929	
		6,346
Surplus at close of year.....		\$78,898

George E. Hamilton, the president, in presenting the report, said in part:

"Car earnings show an increase over 1911 of \$9,967, miscellaneous income an increase of \$1,750 and operating expense a decrease of \$28,828, making a net increase from operation of \$40,546. There was an increase in fixed charges of \$63,699, due principally to interest on bonds issued in December, 1911, under mortgage of June 1, 1907.

"The funded debt of the company is \$6,000,000 of bonds, authorized and secured under mortgage of June 1, 1907, of which \$5,639,500 is issued and outstanding, the remaining \$360,500 being held in the treasury to meet future extensions and betterments.

"The fire insurance reserve fund on Dec. 31, 1912, was \$166,694, an increase of \$10,219 over the preceding year.

"The reconstruction of the Navy Yard, Georgetown and Seventh Street carhouses, made necessary, as set forth in the last annual report, to care for and accommodate the double-truck single cars now operated by the company, has been fully completed.

"The 150 pay-within cars ordered in 1910 have been all received and put in operation. Five pay-within cars were ordered for the Chevy Chase division of a type similar to those in use on that division, and these were received and put in service in October. Thirty semi-convertible cars, in use on the Fourteenth Street line, are being converted to the pay-within type, the work being done in our own shops.

"During the year the small single-truck motor and trailer cars have all been retired, and the company is now operating only double-truck single cars on all of its divisions.

"To secure safer operation it was concluded to equip all cars in service on city lines with air brakes, and accordingly, under authority of the board of directors, a contract was made with the Westinghouse Traction Brake Company for 233 air-brake equipments. Two of these equipments were delivered in August and immediately installed for the purpose of instruction. Different shipments, making a total of fifty-two equipments, have been received up to the present time, and forty-one cars have been equipped with air brakes and are now in service on city lines.

"The adoption of fare boxes by the company has been under consideration for some time, and on Dec. 1, 1912, for the purposes of test and better information, the Union Station and Pennsylvania Avenue lines were completely equipped with the Cleveland fare box.

"During the year 1912, in addition to the ordinary track repairs and maintenance, considerable new track work has

been completed. The new track work has consisted of additions to the loop at the Seventh Street carhouse in connection with the reconstruction of that carhouse and the installation of an automatic switch at the Decatur Street carhouse.

"The new power plant at the corner of Thirty-second and K Streets has been completed and equipped, and additional duct lines have been built and the necessary cable installed, thus giving to the company proper service amply to care for its present needs. One 525-kw direct-connected engine-driven unit and two 300-hp boilers were moved from the Grace Street plant, now abandoned, to the Chevy Chase power station and put in service in June. This installation gives a satisfactory plant at Chevy Chase for handling the increased load on that division.

"The claim department shows a decrease over the preceding year in the amount paid out in unlitigated claims of \$3,378. The number of claims brought during the year against the company was less by sixty-eight than in the preceding year. The bulk of claims against the company during the year have grown out of collisions between cars, with vehicles and pedestrians. It is expected that this condition will be materially mitigated by the installation of air brakes. This department shows a decrease in payments on account of boarding and alighting accidents. A still further reduction in the number of such accidents is, by reason of our uniform equipment of pay-within cars, expected in the future.

"The sum of \$55,000 has been charged off the surplus and credited to depreciation reserve fund. The sums of \$50,804 expended for the rebuilding of tracks on Pennsylvania Avenue between Second and Seventh Streets, Northwest, and \$149,364 of the amount expended for new double-truck cars, purchased to replace single-truck cars abandoned under order of the Interstate Commerce Commission, were charged to this fund."

The report contains the following statistics of passengers carried:

Number of passengers carried at 4½ cents.....	41,746,329
Number of passengers carried at 5 cents.....	9,906,805
Number of passengers carried on commutation tickets.....	955,734
Total number of revenue passengers.....	52,608,868
Transfer passengers	18,472,325
Total number of passengers.....	71,081,193

The J. G. Brill Company

The report of Samuel M. Curwen, president of The J. G. Brill Company, Philadelphia, Pa., for the year ended Dec. 31, 1912, was presented to the stockholders on Feb. 12, 1913. Some of the main features of the report are printed below:

"The total sales value of the combined output of all the five plants owned and operated by The J. G. Brill Company for the twelve months ended Dec. 31, 1912, was \$7,842,090. The amounts of the combined sales of the five plants for the six years prior to 1912 are here given for purposes of comparison: 1907, \$9,211,825; 1908, \$3,845,173; 1909, \$4,261,204; 1910, \$5,960,778; 1911, \$5,870,907; 1912, \$7,842,090.

"The combined profit resulting from the operation of the plants owned and operated by your company during the year 1912 amounted to \$1,054,851. The regular quarterly dividend on the preferred stock of your company, at the rate of 7 per cent per annum, amounting to \$80,150, was declared by the directors at a meeting held Jan. 20, 1913, and was paid on Feb. 1.

"Your properties were all maintained during the year in excellent physical condition, and the entire expense of all maintenance and upkeep, amounting to \$217,273, was taken from current earnings. During the year there was set aside out of earnings, as an addition to the depreciation reserve, the sum of \$135,826, in pursuance of the regular conservative policy of your management.

"The general business conditions throughout the country during the year 1912 were reflected in the increased activities of your companies. In addition to the increase in domestic orders, your management is able to report a substantial increase during the year in your companies' foreign business. The amount of work obtained and executed during the year represented, in total, more nearly a normal output for your combined plants than any year's business since 1907. The ability of your companies to absorb, in the nor-

mal cost of so large an output, substantially all of their general expenses, manufacturing and administration, is indicated by the net profit resulting from the year's operations.

"On Feb. 1 the amount of orders of your combined companies in process of execution amounted to \$4,140,689."

The combined balance sheet as of Dec. 31, 1912, and the condensed statement of combined sales and expenses for the year 1912 follow:

COMBINED BALANCE SHEET, DEC. 31, 1912	
Assets:	
Value of properties	\$8,003,102
Materials, raw and in process.....	1,850,549
Bills and accounts receivable	1,812,199
Investments	288,272
Cash	399,356
	\$12,353,478
Liabilities:	
Preferred stock	\$4,580,000
Common stock	5,000,000
Bonds (John Stephenson Company).....	400,000
Bills and accounts payable	995,559
Portion of surplus of G. C. Kuhlman Car Company set aside as working capital of that company.....	144,361
Surplus	1,233,558
	\$12,353,478
SALES AND EXPENDITURES FOR YEAR 1912	
Total sales and other income.....	\$7,842,090
Less material used, operating and all general and administration expenses and depreciation for the year.....	6,787,239
Net profit undistributed, added to surplus.....	\$1,054,851
Surplus account, from previous year.....	\$744,521
Less adjustments	100,853
	\$643,668
Profit as above	1,054,851
	\$1,698,519
Less dividends paid during year.....	320,600
	\$1,377,919
Less part of this combined surplus represented by the portion of surplus of G. C. Kuhlman Car Company now set aside for permanent surplus of that company, as an addition to its working capital	144,361
Net surplus	\$1,233,558

Detroit United Railway

The following is a summary of the business of the Detroit United Railway, the Rapid Railway System, the Sandwich, Windsor & Amherstburg Railway, the Detroit, Monroe & Toledo Short Line Railway and the Detroit, Jackson & Chicago Railway, for the years 1912 and 1911:

	1912	1911
Passenger earnings	\$10,932,686	\$9,615,118
Express earnings	704,068	586,995
Mail earnings	11,939	11,907
Special car earnings	46,837	39,113
Gross earnings from operation	\$11,695,530	\$10,253,133
Operating expenses	7,730,409	6,580,041
Net earnings from operation	\$3,965,121	\$3,673,092
Income from other sources	208,857	178,812
Gross income less operating expenses.....	\$4,173,978	\$3,851,904
DEDUCTIONS		
Interest on funded and floating debt, and taxes:		
Detroit United Railway.....	\$1,539,974	\$1,544,570
Rapid Railway System	166,792	163,167
Sandwich, Windsor & Amherstburg Railway...	35,414	35,261
Detroit, Monroe & Toledo Short Line Railway...	160,167	158,171
Detroit, Jackson & Chicago Railway.....	221,166	222,228
	\$2,123,513	\$2,123,397
Credited to depreciation reserve.....	500,000	400,000
Credited to contingent liability reserve.....	100,000	.....
Dividends	625,000	625,000
Total deductions	\$3,348,513	\$3,148,397
Net income to surplus	\$825,464	\$703,506

PASSENGER STATISTICS, YEAR 1912

	Total
Revenue passengers	208,538,594
Transfer passengers	61,393,877
Employee passengers	7,646,593
Total passengers	277,579,064
Receipts from revenue passenger.....	.0525
Receipts per passenger.....	.0394

MILEAGE STATISTICS, YEAR 1912

Car mileage	42,351,690
Earnings, car mile .....	.2761
Expenses, car mile .....	.1825
Net earnings, car mile .....	.0936

There has been expended on capital account during the year, and charged out under the head of "additions and betterments," in accordance with the classification of expenditures for road and equipment prescribed by the State and Interstate Commerce Commissions, as follows: road, \$726,-

037; equipment, \$482,260; general expenditures, \$5,578; total, \$1,213,876.

Of this company's collateral trust notes, \$1,500,000, maturing on Jan. 1, 1912, were paid and retired out of the proceeds of the sale, to stockholders, of Detroit United Railway 4½ per cent bonds.

On Dec. 1, 1912, bonds of the Detroit Railway aggregating \$50,000 became due and were paid.

During the year the company made liberal expenditures for the maintenance of its tracks, rolling stock and other properties. On Jan. 1, 1912, the depreciation reserve stood credited with \$1,529,627. There was expended during the year for replacement of cars \$96,263, of which \$36,263 was charged into maintenance of equipment and \$60,000 to the depreciation reserve. This reserve was credited with \$500,000 out of the income for 1912, and \$54,000 from scrap sales, leaving the balance at Dec. 31, 1912, \$2,023,627.

Chicago Elevated and Surface Railways Requested to Present Their Plan of General Merger

Following an appeal by W. G. Beale, counsel for the elevated railroads for immediate action to bring about the general merger of the surface and elevated railways in Chicago, the local transportation committee of the Chicago City Council requested the representatives of the companies interested to submit to the committee their plan for a merger which will form a basis of the general merger ordinance. A special meeting of the committee will be called as soon as the companies are ready with their plans.

No further action has been taken to reconcile the real estate valuations since the committee refused to accept the offer of the Cook County Real Estate Board, the remuneration for which was considered excessive. It has been decided that each member of the sub-committee with the general merger proceedings in hand submit the names of three real estate men who would be willing to act as a reconciliation board at a more reasonable compensation.

A new aspect in the general merger proceedings developed at this meeting when a copy of resolutions adopted by the Northwest Side Commercial Association was read. These resolutions were directed to the Mayor and all the Aldermen and protest against any merger or subway proposition being submitted to the voters at the April election.

West Penn Traction & Water Power Company

The annual statement of the West Penn Traction & Water Power Company, Pittsburgh, Pa., for the year ended Dec. 31, 1912, showed the largest earnings ever reported. Gross earnings were \$3,408,586, an increase of \$1,148,299; expenses and taxes, \$1,829,459, an increase of \$717,178; net earnings, \$1,579,127, an increase of \$431,121; fixed charges, \$794,748, an increase of \$266,472. The surplus remaining was \$549,379, an increase of \$164,649. A comparative statement for three years follows:

	1910	1911	1912
Gross earnings	\$2,042,002	\$2,260,287	\$3,408,586
Operating expenses and taxes.....	987,642	1,112,281	1,829,459
Net earnings	\$1,054,360	\$1,148,006	\$1,579,127
Fixed charges	470,504	528,276	794,748
Balance	\$583,856	\$619,730	\$784,379
Guaranteed dividends	235,000	235,000	235,000
Surplus earnings	\$348,856	\$384,730	\$549,379

Atlantic Shore Line Railway, Sanford, Me.—The Atlantic Shore Line Railway has applied to the Railroad Commission of Maine for authority to increase its stock from \$1,000,000 to not more than \$2,500,000.

Chicago City & Connecting Railways, Chicago, Ill.—The income account of the Chicago City & Connecting Railways for 1912 compared with 1911 is as follows: Gross income for 1912, \$2,437,250, as against \$2,612,673 for 1911; total disbursements for 1912, \$1,151,007, as against \$1,148,763 for 1911; net income for 1912, \$1,286,243, as against \$1,463,910 for 1911; dividends on participation shares for 1912, \$1,275,000, as against \$1,425,000 for 1911; surplus income for 1912, \$11,243, as against \$38,910 for 1911. During the year only 1 per cent was paid on common participation certificates, against 2 per cent the previous year.

Detroit (Mich.) United Railway.—A quarterly dividend of 1½ per cent has been declared on the \$12,500,000 of stock of the Detroit United Railway, payable on March 3, 1913, to holders of record of Feb. 14. This payment compares with 1¼ per cent paid quarterly from March, 1911, to December, 1912. The Railroad Commission of the State of Michigan has authorized the Detroit & Port Huron Short Line Railway, operated by the Detroit United Railway under the name of the Rapid Railway System, to increase the amount of its outstanding capital stock from \$2,000,000 to \$2,075,000 to reimburse the Detroit United Railway for expenditures made for extensions and improvements.

Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.—The Fresno, Hanford & Summit Lake Interurban Railway has applied to the Railroad Commission of California for authority to issue \$1,250,000 of bonds.

Galveston-Houston Electric Company, Galveston, Tex.—A semi-annual dividend of 2½ per cent has been declared on the \$3,000,000 of common stock of the Galveston-Houston Electric Company, payable on March 15, 1913, to holders of record of Feb. 20. This compares with 2 per cent paid in September, 1912, and 1½ per cent paid from September, 1909, to March, 1912, inclusive.

Georgia Railway & Power Company, Atlanta, Ga.—The Georgia Railway & Electric Company, the property of which is operated under lease by the Georgia Railway & Power Company, has applied to the Railroad Commissioners of Georgia for permission to issue \$828,000 of bonds to cover 75 per cent of the cost of improvements made to the property of the company in 1912.

Louisville (Ky.) Railway.—The Louisville Railway has authorized the issuance of \$1,000,000 of bonds under the general mortgage of 1910 given to secure \$20,000,000 of bonds. Of the \$20,000,000 issue a total of \$4,000,000 has been issued to date by the company. The proceeds from the sale are to defray the expense of erecting the new power house of the company at Twenty-first and High Streets, which cost about \$750,000, complete, to provide funds to extend the Orell line of the Louisville & Interurban Railroad a distance of 8 miles to Kosmosdale, Ky.; construct the Main Street extension, and for other improvements.

National Properties Company, Pittsburgh, Pa.—H. B. Hollins & Company and Newberger, Henderson & Loeb, New York, N. Y., are offering for subscription the unsold balance of \$1,649,000 of 6 per cent cumulative preferred stock of the National Properties Company on the basis of \$1,000 par value of preferred stock and \$400 par value of common stock for \$970. The par value of the shares is \$100 each and the dividends are payable on Jan. 15 and July 15. As previously stated in the ELECTRIC RAILWAY JOURNAL the National Properties Company has recently taken over the property of the Wilmington & Philadelphia Traction Company and controls by stock ownership the Pittsburgh City Light & Power Company and the water company of Tonopah, Nev. The company has an authorized capital stock of \$20,000,000, of which \$10,000,000 is preferred stock and \$10,000,000 common stock. Of this capitalization \$1,649,000 of preferred stock and \$1,992,000 of common stock is outstanding.

Philadelphia (Pa.) Rapid Transit Company.—A special meeting of the Union Traction Company has been called for Feb. 26, 1913, to obtain formal consent to the recently announced plans of the Philadelphia Rapid Transit Company for the creation of an equipment trust.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa.—The property of the Pittsburgh, McKeesport & Westmoreland Railway will be sold under foreclosure on Feb. 25, 1913, in the rotunda of the Allegheny County Court House, Pittsburgh. No bid for less than \$60,000 will be accepted, and the purchaser will take the property subject to the lien of two mortgages aggregating \$437,000, with accrued interest. The \$50,500, issue of receiver's certificates, the interest accrued thereon and the costs and expenses of the receivership will be paid out of the proceeds of the sale.

Syracuse, Lake Shore & Northern Railway, Syracuse, N. Y.—The Public Service Commission of the Second District of New York has authorized the Syracuse, Lake Shore & Northern Railway to issue \$350,000 of short-term

notes, to bear not more than 5 per cent interest, and to be sold to net 97.65 per cent. The proceeds of the issue are to be used to pay outstanding notes.

Toledo Railways & Light Company, Toledo, Ohio.—It is believed that officers will not be elected by the directors of the Toledo Railways & Light Company until the next regular meeting on Feb. 27. An adjourned meeting of the board has been fixed for Saturday, Feb. 15, 1913, but it will probably be continued until the date for the regular meeting. The action of the reorganization committee in arranging with the Doherty interests to operate the property has been approved by the directors. L. E. Beilstein and R. C. Pugh, Toledo; Dr. W. H. Netherlands, Louisville, and W. E. Hutton, Cincinnati, have resigned as members of the board in order to make room for representatives of H. L. Doherty & Company. P. E. Schilling, W. J. Marshall, William R. Hodge and H. S. Swift have been elected as their successors.

Twenty-eighth & Twenty-ninth Streets Crosstown Railroad.—Justice McCall in the Supreme Court has dismissed the complaint in the suit brought by Joseph B. Mayer, receiver of the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad against the directors of the Metropolitan Street Railway at the time of its dissolution, to compel them to account for the proceeds of \$1,100,000 of 5 per cent bonds of the company which it is alleged were not used for the company's benefit. The court held that the bonds were legally issued and the proceeds put to proper use.

United Light & Railways Company, Grand Rapids, Mich.—The United Light & Railways Company has purchased the properties of the People's Gas & Electric Company, Mason City, Ia., and the Mason City & Clear Lake Interurban Railway. The United Light & Railways Company has also made a contract to operate the Iowa & Illinois Electric Railway between Davenport and Clinton, a distance of 40 miles, for four years, with an option to purchase the railway at the end of that time.

Dividends Declared.

Brockton & Plymouth Street Railway, Brockton, Mass., 3 per cent, preferred.

Detroit (Mich.) United Railway, quarterly, 1½ per cent.

Federal Light & Traction Company, New York, N. Y., quarterly, 1½ per cent, preferred.

Galveston-Houston Electric Company, Galveston, Tex., 3 per cent, preferred; 2½ per cent, common.

Kokomo, Marion & Western Traction Company, Kokomo, Ind., three-quarters of 1 per cent, common.

Northern Texas Electric Company, Fort Worth, Tex., 3 per cent, preferred; quarterly, 1¼ per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, CHICAGO, ILL.

Period.	Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.
1mo., Dec., '12	\$155,454	\$97,348	\$58,105	\$32,071	\$26,034
1 " " '11	143,178	95,141	48,037	31,940	16,097
16 " " '12	1,050,486	594,646	455,840	192,466	263,373
6 " " '11	982,945	551,931	431,014	189,156	241,858

ATLANTIC SHORE RAILWAY, SANFORD, MAINE

1mo., Dec., '12	\$23,407	\$17,756	\$5,651	\$465	\$5,186
1 " " '11	22,840	21,111	1,729	582	1,148

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

1mo., Dec., '12	\$97,271	\$59,564	\$37,707	\$32,066	\$5,641
1 " " '11	94,020	53,808	40,213	33,661	6,552
12 " " '12	1,059,315	693,529	489,803	373,113	116,690
12 " " '11	991,048	641,181	495,181	363,523	131,658

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

1mo., Dec., '12	\$173,866	\$100,685	\$73,180	.....	.....
1 " " '11	151,556	84,671	66,885	.....	.....
12 " " '12	1,722,648	1,008,036	714,612	.....	.....
12 " " '11	1,496,177	887,095	609,083	.....	.....

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1mo., Dec., '12	\$259,881	\$150,778	\$109,103	\$52,330	\$56,773
1 " " '11	239,373	132,964	106,409	43,912	62,497
12 " " '12	2,996,037	1,702,766	1,293,271	572,998	720,273
12 " " '11	2,694,024	1,492,527	1,201,498	531,032	670,466

Traffic and Transportation

Reduction in New York Suburban Fares Ordered

Reductions in the fares charged to commuters between Westchester County points and New York City by the New York Central & Hudson River Railroad have been ordered by the Public Service Commission, Second District. The reduced rates will result in the re-establishment of the rates which were in effect on June 30, 1910. The territory affected is: on the New York Central, Hudson division, from Ludlow to Peekskill, inclusive, and Harlem division, from Williamsbridge to White Plains, inclusive; on the New York, New Haven & Hartford Railroad, from the Grand Central Terminal, New York, and stations from Mount Vernon to Port Chester, inclusive.

The reductions effected on the New York Central & Hudson River Railroad are as follows: on the Hudson division, on sixty-trip monthly commutation tickets, from a minimum of 60 cents per ticket per month to a maximum of \$1.15 per ticket per month and on fifty-trip family tickets from a minimum per ticket of 25 cents to a maximum per ticket of \$3.30. On the Harlem division, round-trip tickets are: between New York and Mount Vernon, 15 cents; Wakefield, Bronxville and Tuckahoe, 10 cents; Crestwood, Scarsdale, Hartsdale, and White Plains, 5 cents; on sixty-trip monthly commutation tickets, varying amounts from a minimum of 75 cents per ticket per month to a maximum of \$1.05 per ticket per month; on fifty-trip family tickets, from a minimum of 95 cents to a maximum of \$2 per ticket.

On the New York, New Haven and Hartford Railroad the reductions are: on one-way tickets, 5 cents in each instance; on sixty-trip monthly commutation tickets, 20 per cent; on fifty-trip family commutation tickets the reductions vary from a minimum of 13 per cent to a maximum of 25 per cent.

The new rates are ordered to be put into effect on March 1, 1913, and to continue for a period of at least three years. It is provided also that all tickets sold prior to March 1, for use on or after that date, are to be sold at not to exceed the rates as reduced.

The orders were made upon complaints filed in the New York Central & Hudson River Railroad case by the mayors of Mount Vernon and Yonkers and residents of Peekskill and White Plains, and in the New York, New Haven & Hartford Railroad case upon the complaints of the mayors of Mount Vernon, New Rochelle, the village of Port Chester, the towns of Rye and Harrison, and residents of the city of New Rochelle and village of Port Chester.

The commission concluded its decision in the case in part as follows:

"An attentive study of the evidence submitted satisfies us that the increased rates have operated unfavorably to the communities affected, that they have discouraged travel, that they have not permitted the growth and development of the communities within the commutation zone, and that they have added materially and unjustifiably to the burden of those who are required to travel back and forth daily in order to carry on their business in the city.

"The commission is also satisfied from the evidence that the revenues derived from the increased rates have not increased above those received formerly in anything like the proportion of increase of rate. The ostensible reason of the companies for increasing these rates was the increased expense of operation and the necessity for more revenue to meet this increase. This expectation has in a large measure, according to the evidence, been disappointed. The operating costs have not been decreased, but the gross earnings from the commutation rates have not afforded the relief to the companies which they expected from the increase in rates. This is another proof that the effect of the increase has been to diminish travel and not to better the net financial result to the companies. We are convinced that the fares of the companies complained of tend to restrict rather than to promote travel and to such an extent as to defeat materially the purpose for which commuters' fares are primarily established.

"These cases have not been free from embarrassing questions. The commission is not disposed to overlook or minimize the contention of the respondents that the increase in

costs of operation arising from increased wages and greater cost of material should be reflected in rates. It should not be forgotten that the increased costs claimed by the respondents arise largely from the alleged increased cost of moving trains by electric energy. The commission feels that, assuming some such increased cost to have been shown, there should be taken into consideration in connection therewith that the change from steam to electricity as a motive power has made possible the utilization of the site of the Grand Central Terminal for other purposes and to an extent that may well pay an adequate return upon the cost of the station itself. It is a serious question to be determined only by future developments whether the use of electric energy is not the only possible method of economical operation in a city like New York, and whether it will not, all things considered, justify the continuance of the former rates rather than an increase in rates.

"There is another matter of large importance in the case of the New York, New Haven & Hartford Railroad. It has at very great expense built and put in operation the New York, Westchester & Boston Railroad as far as New Rochelle. It contemplates a completion of that line to Port Chester as soon as the work can reasonably be performed. When that road is completed to Port Chester, if it makes such connections and arrangements in New York City as to enable it to furnish a service as convenient and adequate as that which the New York, New Haven & Hartford Railroad now furnishes into the Grand Central Terminal, a question will at once arise whether the New York, New Haven & Hartford Railroad may not justly seek by all reasonable means to divert traffic from its main line to its subsidiary, the New York, Westchester & Boston Railway, and thereby reduce its terminal expenses and increase its returns upon its subsidiary investment. If it were assumed that the company might justly do so, always keeping in mind that the service must be in every respect convenient and adequate, still until that road is completed to Port Chester, and proper subway connections are made, the question cannot arise for determination."

Puget Sound Electric Railway Fare Case Carried to Courts

The Puget Sound Electric Railway, operating between Seattle and Tacoma and other points, has appealed to the federal court for an order declaring void and of no effect the order of the Public Service Commission of Washington made in 1911, directing the company to reduce its fares. The company declared in its petition that its net earnings during the twelve months ended Nov. 20, 1912, had equaled a rate of return on the original money invested of 1.382 per cent. Interest at the rate of 5 per cent was charged on the outstanding bonds secured by the mortgage lien, and the company asserted that it would be necessary for it to increase its rates between Seattle and Tacoma and other points above the rates ordered and allowed by the Public Service Commission to prevent the default and foreclosure of the mortgage.

The petition further sets forth that the Public Service Commission had estimated the company's receipts during 1910 to be \$372,959, this estimate being made before the order decreasing the rates was handed down early in the same year. The receipts actually were, the company asserts, \$218,253. The gross receipts from all sources in the six months ended June 1, 1912, were set forth as \$288,250 and the expenses as \$272,516, leaving a net revenue of \$15,733. The rate of return on the original investment of approximately \$4,000,000 was 0.773 per cent, it is alleged. Between June 1 and Nov. 30, 1912, the gross earnings were \$308,418 and the expenses \$267,911, leaving \$40,506 of net earnings, and making the total rate of return on the original investment for the year 1.382 per cent. It is claimed that at least 7 per cent should be allowed the company.

The matter of interurban rates in the valley between Seattle and Tacoma, Renton and other points has been in the courts since 1909, when the Puget Sound Electric Railway put into effect its new tariff, charging 2 cents a mile or allowing commutation tickets good for a period of one month at 1.4 cents. Hearing was ordered by the Public Service Commission on complaints made by residents of the valley and early in 1910 the tariff was declared excessive. Ten days were allowed for a new tariff to be prepared.

After the ten days had expired and no new rates had been made, the commission itself ordered the fares reduced. Appeal was taken by the company to the Superior Court in Thurston County, which affirmed the commission. In September, 1911, the State Supreme Court affirmed the lower court, and the company began to comply with the commission's ruling.

The plan of the company to appeal to the courts for relief from the order of the commission was referred to in the *ELECTRIC RAILWAY JOURNAL* of Jan. 25, 1913, page 173.

Proposed Terminal Station for Illinois Traction System at Peoria, Ill.

The general plans for the proposed terminal station of the Illinois Traction System at Peoria, Ill., have been approved and an appropriation made to cover the improvements. A Peoria firm of architects, Hotchkiss & Harris, are preparing the construction details. The general plans call for a building seven stories high and faced with white glazed terra cotta. The terminal building proper will be 100 ft. long by 58 ft. wide with a train-shed adjoining which will provide storage capacity for twenty cars. Provision was made for the erection of this terminal last year by the purchase of a site of the old National Hotel at Hamilton and Jefferson Streets following the destruction of the hotel by fire. Construction work will be started as soon as the weather permits.

Some of the details already worked out in the terminal station building and track layout include five tracks on the north of the terminal building proper for the accommodation of regular trains and sub-tracks on the west of the building for storage space for special and sleeping cars. The train shed will be built of steel and concrete and a running repair pit will be provided under one of the outside tracks. The waiting room will occupy practically the whole first floor of the terminal building, being 40 ft. x 80 ft. in plan and two stories high. Entrances to the waiting room will be provided on Hamilton and Jefferson Streets. Space has been provided for a restaurant, baggage room, check room and ticket office adjoining the waiting room. A portion of the first floor will also be reserved for four small stores. The third and fourth floors of the building will be occupied by the general offices of the Illinois Traction System and the Peoria Railway.

One of the features of the new terminal station will be an elaborate scheme of night illumination. According to present plans about 10,000 incandescent lamps will be arranged to mark the outlines of the building as well as the windows, panels and ornamental features on all four sides. The plan of illumination has been modeled to a certain extent after the Denver Gas & Electric Company's building, Denver, Col. It is estimated that the new terminal station and track layout will cost \$350,000.

Illinois Road to Check Baggage.—The Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., has announced that it will check baggage up to 150 lb. with each ticket.

Park for Chicago, Ottawa & Peoria Railway.—The Chicago, Ottawa & Peoria Railway, Ottawa, Ill., has leased a 5-acre tract of land 2½ miles north of Grand Lodge, Ill., which will be operated as a place of amusement under the name of McKinley Park. The company will use the equipment from Majestic Park, west of Ottawa.

Owl Car Service in Birmingham.—The owl line of the Birmingham Railway, Light & Power Company, Birmingham, Ala., on which cars are operated between 1 a. m. and 4 a. m. is the Baylies line. The company now proposes to establish an experimental service between these hours on seven lines and to make the service permanent if the patronage justifies it.

Y. M. C. A. Membership as Reward for Efficiency.—The Kentucky Traction & Terminal Company, Lexington, Ky., has arranged for full membership in the Lexington branch of the Young Men's Christian Association for each of its employees in recognition of efficient service, thus giving the holder the privileges of the gymnasium, baths, libraries and other conveniences. Practically every employee will avail himself of the gift.

New Parcel Express Service on Pennsylvania Line.—The Northwestern Railway, Meadville, Pa., expects to put into operation about Feb. 15 a parcel express system on its lines in Meadville and on the interurban lines from Meadville to Linesville, Cambridge Springs and Erie. The territory covered has been divided into three zones and a schedule of rates fixed for each zone. Special adhesive tickets will be provided which patrons may use in pre-paying transportation charge on a package by sticking them on the wrapper. The limit of weight under the new system will be 100 lb.

Increase in Fare in Effect Between Trenton and Princeton.—The increase in fare from 10 cents to 15 cents over the line of the Trenton & Mercer County Traction Corporation between Trenton and Princeton, N. J., was put into effect on Feb. 15, 1913, with the approval of the Board of Public Utility Commissioners of New Jersey. The company has divided the territory between Trenton and Princeton into three fare zones. The first zone extends from State and Broad Streets, Trenton, to the foot of Darrah's Hill, about 1½ miles south of Lawrenceville. The second zone extends from this point to the northerly line of Lawrence Township, about 2 miles south of Princeton. The last zone extends from this point to the terminus of the line in Princeton.

Suit to Force Extension of Transfer Privileges.—In their efforts to force an extension of the transfer privileges between the County Traction Company and the Chicago Railways, the attorneys for the villages of Oak Park and Riverside have examined many witnesses. Among the officers of the Chicago Railways who have appeared on the witness stand are H. A. Blair, chairman of the board of directors, and J. M. Roach, president of the company. The history of the reorganization of the two companies has been covered and canceled checks and vouchers have been submitted in evidence to establish the ownership of the County Traction Company. The attorneys for the village completed their case on Feb. 11 and the defendant companies began to present their side by introducing documentary evidence.

Explosion of Air Tank on Car at Allentown.—The end of an air tank on a car of the Lehigh Valley Transit Company, Allentown, Pa., in the yard of that company in that city blew out on the night of Oct. 8, 1913, giving rise to a rumor that a series of explosions had occurred. R. P. Stevens, president of the company, says that the total damage does not amount to more than \$25. An enterprising newspaper correspondent at Allentown, too busy at the hour at which the accident happened to investigate the matter, put a greatly exaggerated story on the wires, which was accepted elsewhere as authoritative and received considerable publicity. The writer of this story, in a wild flight of fancy, had "Mayor Rinn and thirty officers on the scene in a jiffy by automobiles; but diligent search failed to reveal any culprit."

Plan to Prevent Smoking on Cars in Springfield, Mass.—City Solicitor Scott Adams, of Springfield, Mass., has addressed a letter to the Board of Health of Springfield in which he discusses the plan of that body to regulate smoking on street cars in that city. Mr. Adams in giving his opinion reviewed at length the statutes and ordinances on which the authority of the board in regard to nuisances was based, and also discussed the question of public and private nuisances. He thinks that probably smoking in street cars might be considered a public nuisance, but is uncertain whether it could be shown to have damaging effect on health or property. In his conclusions he draws attention to the fact that such matters as expectoration in public places, smoke nuisances and the matter of sanitary precautions in regard to microscopes have all been regulated by boards of health under special statute rather than with the authority of the general law, and suggests that the board could probably secure the enactment of such a statute at the present term of the Legislature.

Why the Street Car Service Isn't Better.—Frank Hedley, vice-president and general manager of the New York (N. Y.) Railways, contributed a full-page article to the New York *Sunday Sun* of Feb. 9, 1912, headed "Why the Street Car Service Isn't Better." The *Sun* prefaced the article by saying that the other side was entitled to its inning and that "Mr. Hedley is one of the most expert public transportation

managers in the world, hence his statements will be received with interest." Mr. Hedley, first referred to the geographical formation of Manhattan Island and to the limitations on service which this formation sets. He then referred to the magnitude of the passenger movement and to the tendency to continue to increase the height of buildings, with the result that certain thoroughfares are choked with pedestrian traffic. He next discussed the necessity for running by passengers so as to prevent bunching of cars and to the theory of the "turn back." He told at considerable length about the power of inspectors to deal with emergencies and referred particularly to the limitations of the underground conduit system under the peculiar climatic and commercial conditions which obtain in New York.

Joint Operation of Interurban Lines.—Arrangements have been made whereby the Tri-City Companies will furnish the current for the operation of the Iowa & Illinois Railway and for light and power service along the route of the railway. At the same time joint operation has been provided for between the Iowa & Illinois Railway and the Davenport & Muscatine Railway, that economies may be effected and through service secured between Clinton, and Muscatine, via Davenport. This arrangement is to be effective until Jan. 1, 1917. The freight service in connection with the Chicago & Northwestern Railway will be continued and extended and it is expected that the new source of power will enable the Iowa & Illinois Railway to extend its already effective service. The following directors have been elected: Garret E. Lamb, F. W. Ellis and R. B. McCoy, Clinton, Ia.; Joe R. Lane, J. G. Huntoon, P. P. Crafts, J. F. Porter, H. E. Weeks and George G. Kuhn, Davenport, Ill. The officers will be Joseph F. Porter, president; F. W. Ellis and P. P. Crafts, vice-presidents; H. E. Weeks, secretary and treasurer. Mr. Crafts will have the direct charge of the management of the interurban properties as general manager.

Service Question in Atlanta.—In connection with the order of the Railroad Commission of Georgia to the Georgia Railway & Power Company, Atlanta, Ga., in regard to service on the Ponce de Leon Avenue line of the company, Vice-president Glenn of the company wrote to the commission that the company would be glad to have the commission define what it thinks are the rush hours on the line, as the company had found from experience that the rush hours vary on different lines. In its reply the commission stated as follows its reason for not being more specific when the original order was made: "The commission was aware of the fact that the rush hours varied on your different lines, and presuming that you knew approximately the hours on each particular line, intended to leave it to your good judgment and experience to operate this increased service during the hours which in good faith you concluded from your records were rush hours. The hours this commission had in mind from the data before it were from 6.30 a. m. to 9.30 a. m., from 12 m. to 3 p. m., and from 4.30 p. m. to 7 p. m., and in view of your uncertainty in the premises you may take the above as the rush hours contemplated by the commission."

Modification of Ventilating System of Chicago Near-Side Cars Proposed.—The only objection which has been made to the operation of the near-side cars in Chicago was brought before the local transportation committee of the City Council on Feb. 10, 1913. It was complained that the dust which enters the cars through the ventilators located near the car floor is offensive. Leonard A. Busby, president of the company, explained to the committee that the company was testing several methods to remedy this defect. As an experiment a fine mesh screen has been installed to act as a baffle to the dust, care being taken to see that the screen does not decrease appreciably the amount of fresh air admitted to the car. The company has also considered the advisability of closing the intakes at the rear of the car and taking air from the front only. In case none of the plans which have been suggested to overcome the trouble prove effective the company will resort to the old method of taking in all of the fresh air at the roof of the car and exhausting it at the roof. When interviewed later, Mr. Busby added that in all other respects the cars are giving greater satisfaction than was anticipated when they were first placed in service. They have eliminated boarding and alighting accidents and have proved otherwise efficient.

Personal Mention

Mr. Lawrence A. McVeigh, formerly of the New York (N. Y.) Railways, has been appointed assistant auditor for the receivers of the New York, Auburn & Lansing Railroad and assistant auditor for the receivers of the Ithaca (N. Y.) Street Railway.

Mr. James P. Barnes, who has been chief engineer of the Syracuse (N. Y.) Rapid Transit Railway, has been appointed general manager of the Syracuse & Suburban Railroad to succeed Mr. Milford Badgero, who will devote himself very largely to Allen & Peck, Inc., of which he is secretary and assistant treasurer.

Mr. T. P. Alston has been appointed general manager of the St. John's Electric Company, St. Augustine, Fla. Mr. Alston was previously for ten years general manager of the Florida Railway and before that was purchasing agent of another steam railroad for three years. Previous to that he was for eight years chief clerk in the engineering department of the Florida & East Coast Railway.

Mr. R. H. Rice, formerly division engineer of Division E, having charge of electric power distribution for the Board of Supervising Engineers, Chicago Traction, has been appointed assistant to Mr. George Weston, engineer for the board, in charge of all engineering work. He became associated with the board as assistant division engineer of the electric power distribution division in 1907. At the resignation of Mr. E. N. Lake, division engineer of this division, Mr. Rice was appointed as his successor. The new appointment became effective on Feb. 1.

Mr. James Harmon has assumed new duties with the Louisville & Northern Railway & Lighting Company, New Albany, Ind., a vacancy having been caused by the recent promotion of Mr. Charles B. Scott, who was formerly assistant general manager of the company. Mr. Harmon has become the assistant general manager of the Louisville & Northern Railway & Lighting Company nominally, having especial jurisdiction over the claim department of the company. He has been connected with the claim department since last March, and for several years previous was a motorman in the employ of the company.

Mr. R. F. Kelker, Jr., principal assistant engineer to Mr. George Weston, engineer for the Board of Supervising Engineers, Chicago Traction, has resigned. He has been associated with the board as division engineer track and roadway division since its inception in 1907. At the close of the rehabilitation period he was made principal assistant engineer to Mr. Weston and has held that position up to the present time. In this latter position he had charge of all engineering work handled by the different divisions in the chief engineer's organization. For the present at least Mr. Kelker will discontinue his engineering work and spend several months developing land in Texas in which he is interested.

Mr. A. W. Courmyer has been appointed superintendent of the Sterling, Dixon & Eastern Railway, Dixon, Ill., to succeed Mr. Dean Treat, whose appointment as superintendent of the railway department of the Wisconsin Public Service Company at Green Bay, Wis., was noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 4, 1913. Previous to his appointment as superintendent of the Sterling, Dixon & Eastern Railway, Mr. Courmyer was employed as chief dispatcher and operating superintendent of the Milwaukee Northern Railway. Previous to that he was employed as dispatcher by the Grand Rapids, Grand Haven & Muskegon Railway, having worked up to that position with the company from the post of conductor.

Mr. Charles B. Scott, formerly assistant to Mr. M. J. Insull, general manager of the Louisville Northern Railway & Light Company and the Louisville & Southern Indiana Traction Company, has resigned that position to become manager of the Bureau of Safety organized in connection with the Middle West Utilities Company, Chicago, Ill. The bureau is a separate organization from the utilities company and acts in an advisory capacity relative to the different subsidiaries. Mr. Scott has been associated with Mr. M. J. Insull for the last seven years and in addition to acting as his assistant he was claim agent for the companies named

having charge of accident prevention work. The safety bureau has just been organized and Mr. Scott took charge on Jan. 1.

Mr. Charles J. Laney, traffic manager of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, has been appointed traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, effective on March 1, 1913. Mr. Laney has been connected with the Toledo, Bowling Green & Southern Traction Company and its predecessor, the Toledo Urban & Interurban Railway, since 1907. He was for two and one-half years assistant general freight agent of the company, and in November, 1909, was appointed traffic manager of the company to succeed Mr. H. H. Stephenson. At that time the duties of assistant general freight agent were combined with those of traffic manager. Before becoming connected with the Toledo Urban & Interurban Railway Mr. Laney served in the freight department of the Toledo & Ohio Central Railway and the Wabash Railroad.

Mr. N. H. Brown has resigned as superintendent of the Albany Southern Railway, Rensselaer, N. Y., to accept the position of assistant superintendent of the International Railway, Buffalo, N. Y. Mr. Brown entered railway work with the Syracuse (N. Y.) Rapid Transit Railway in March, 1894, and continued with the company until February, 1907, holding the positions of conductor, motorman, cashier and inspector. He next became general inspector with the Worcester (Mass.) Consolidated Street Railway, and on Sept. 1, 1907, he was promoted to the position of superintendent of the Southbridge division of the company. He continued in the last-named position until Sept. 15, 1912, when he accepted the position of superintendent of the Albany Southern Railway. Mr. Brown was induced to become connected with the International Railway on account of the broader field of opportunities which the position with that company opened to him.

Mr. P. P. Crafts, who has been general manager of the Iowa & Illinois Railway, Clinton, Ia., has also been elected vice-president of that company and general manager of the Davenport & Muscatine Railway in addition, and as general manager of both of these properties he will have direct charge of the management of the companies, which are to establish joint operation between Clinton and Muscatine, via Davenport, as noted elsewhere in this issue of the *ELECTRIC RAILWAY JOURNAL*. Mr. Crafts entered electric railway work sixteen years ago with Stone & Webster in their Boston office. His first four years with this company were devoted to engineering and construction work, but in 1901 he went to Minneapolis as manager of an electric light property there controlled by Stone & Webster. This company was afterward absorbed by the Minneapolis General Electric Company. In 1902 Mr. Crafts became manager of the Saginaw Valley Traction Company, which operates between Saginaw and Bay City, Mich. After the consolidation of this property with the Saginaw-Bay City Railway & Light Company in 1904 he became connected with the Iowa & Illinois Railway as general manager just before the line was completed. He also acted for a time as general manager of the Joplin & Pittsburgh Railway. This position he relinquished on April 1, 1908, in order to devote his whole time to the Iowa & Illinois Railway. Mr. Crafts was president of the Iowa Street & Interurban Railway Association in 1908.

OBITUARY

Daniel F. Lynch, who was connected with the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., died recently at the home of his mother in Indianapolis. Before becoming connected with the Chicago, South Bend & Indiana Railway Mr. Lynch was for eleven years in the employ of the Indianapolis Traction & Terminal Company.

John Patterson, who was one of those instrumental in the formation of the Hamilton (Ont.) Cataract Power Company, which later became the Dominion Power & Transmission Company, died at his home in Hamilton on Jan. 26. Mr. Patterson also assisted in promoting the Hamilton Radial Electric Railway and the Brantford & Hamilton Electric Railway.

Construction News

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

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

RECENT INCORPORATIONS

***Tri-State Traction Company, Warsaw, Ill.**—Incorporated in Illinois to build an interurban railway from Quincy to Hamilton. Capital stock, \$200,000. Headquarters, Warsaw. Incorporators: J. Henry Bastert and Henry F. Dayton, Quincy; John M. Hungate and Richard O. Marsh, Warsaw, and Cornelius T. Daugherty and Earl W. Wood, Hamilton.

***Gary & Interurban Railway, Gary, Ind.**—Incorporated in Indiana to consolidate the Gary & Interurban Railway, the Gary Connecting Railways, the Valparaiso & Northern Railway and the Goshen, South Bend & Chicago Railway. Capital stock, \$5,000,000, of which \$1,000,000 is preferred and \$4,000,000 is common stock. Officers: Frank M. Gavit, Whiting, president, and Alexander Miller, Chicago, vice-president and general manager.

***Quebec Extension Railway, Presque Isle, Maine.**—Application for a charter has been made by this company in Maine to take over the Aroostook Valley Railroad, which operates a 25-mile line between Presque Isle and Washburn. Capital stock, \$4,000,000.

***York & Oxford Railroad, Sanford, Maine.**—Application for a charter has been made by this company in Maine to build an interurban railway from Sanford to a connection with the Boston & Maine Railroad and the Atlantic Shore Line Railway and through the towns of Alford, Waterloo, Limerick, Cornish, Baldwin and Hiram to connect with the Maine Central Railroad and the Bridgeton & Saco River Railroad. Capital stock, \$500,000.

Boston & Eastern Railway, Boston, Mass.—Incorporated in Massachusetts to build a high-speed electric line between Post Office Square and Beverly, with branch lines to Peabody, East Boston, Chelsea, Revere, Saugus, Lynn, Salem, Beverly and Peabody. The plans include a tunnel under Boston Harbor. Capital stock, \$250,000. Directors: John H. Bickford, Charles Dayton, William H. Young, William S. Nichols and William H. Gove. [E. R. J., Oct. 2, '11.]

***Hamilton (Ont.) Mountain Electric Railway.**—Application for a charter has been made by this company to the Ontario Legislature to build an electric or steam railway on the mountain top from the point where the Horning Road, near Ancaster, intersects the Brantford & Hamilton Electric Railway to Mount Albion. Crerar & Awrey, Hamilton, Ont., are acting for local financiers.

***Huron Lake Shore Railway, Sarnia, Ont.**—Application for a charter has been made by this company to build an electric or steam railway from Sarnia to Meaford. Capital stock, \$1,000,000. Incorporators: W. B. Converse, Arthur Terroux, R. B. Dillon and Edward Parker, Montreal, and J. H. Parks, Ottawa.

FRANCHISES

***Little Rock, Ala.**—The T. H. Bunch Coal Company has asked the council for a franchise to build an electric railway over twenty streets and avenues in Little Rock.

***Los Angeles, Cal.**—Frank E. Green, Los Angeles, has asked the Council for a franchise for a double-track line from Thirtieth Street and San Pedro Street extending south on San Pedro Street to South Park Avenue and on South Park and Manchester Avenue in Los Angeles.

Los Angeles, Cal.—The Los Angeles Railway has received a twenty-one-year franchise from the Council in Los Angeles on West Vernon Avenue from Dalton Avenue to the westerly city limits of Los Angeles.

Los Angeles, Cal.—The Pacific Electric Railway has received a franchise from the Council to operate over the San Pedro Street line between Aliso Street and Ninth Street in Los Angeles. The line will be built by the city. Permission was also granted to the company to build a line in Los Angeles Street between First and Seventh Streets.

Richmond, Cal.—The San Francisco-Oakland Terminal Railways, Oakland, has asked for a certificate of public con-

venience and necessity to operate an electric railway on Standard Avenue in Richmond.

Sacramento, Cal.—The Oakland, Antioch & Eastern Railroad has asked the City Commissioners for a franchise to build a spur track at Third and M Streets to connect the main line of the railway with a proposed freight depot in Sacramento.

San Francisco, Cal.—The Supervisors of San Francisco have passed to print the ordinance authorizing the extension of the Geary Street Municipal Railway down Market Street to the corner of Sansome Street, where it will connect with the outer tracks in lower Market Street. The clerk of the board has been directed to advertise the sale of \$120,000 municipal bonds to cover the cost of the extension, bids to be opened Feb. 17.

***Willows, Cal.**—George R. Freeman, Frank Freeman and Leon Speier, Willows, have asked the City Council for a franchise to build an electric railway over Syracuse Street and Walnut Street in Willows.

St. Augustine, Fla.—The Jacksonville & St. Augustine Public Service Corporation, St. Augustine, has received a franchise from the City Council in St. Augustine on Ribera Street from Orange to King's Ferry Way. This is part of a plan to build an electric line from South Jacksonville to Beach Junction and St. Augustine. A. W. Corbett, president. [E. R. J., Jan. 11, '13.]

Lerna, Ill.—The Springfield & Central Illinois Traction Company has received a franchise from the Council in Lerna.

Taylorville, Ill.—The Decatur, Sullivan & Mattoon Transit Company has received a franchise from the Christian County Supervisors to cross the highways of Taylorville with its lines. The company has received a franchise in Moweaqua. [E. R. J., Feb. 8, '13.]

Lexington, N. C.—The North Carolina Public Service Company, Salisbury, has received a sixty-year franchise from the Council for an electric line and a gas plant in Lexington.

Troy, N. Y.—The City Council will be asked to authorize the sale of a franchise for an electric railway in Troy on Fourth Street from Congress Street to a point north of Fulton Street, connecting with the present double track of the United Traction Company.

Utica, N. Y.—The New York State Railways has received a franchise from the Common Council to double-track its line over the overhead railroad crossing at Genesee Street in Utica to connect with the Deerfield line, and to construct a double-track line on Genesee Street from Whitesboro Street to North Genesee Street.

Stratford, Ont.—The ratepayers have passed a by-law granting the Stratford Street Railway a 25-year franchise for an electric railway in Stratford. Confirmation of the by-law is being asked from the Ontario Legislature. Work is to be started on the line in July, provided the by-law is ratified.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company has asked permission to double-track its Meridian Avenue line in Seattle from North Forty-sixth to North Fifty-eighth Street, a distance of 1 mile.

TRACK AND ROADWAY

***Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.**—This company plans to build a line from Lacombe to Gull Lake, Alta, 10 miles, and thence to Rimby, a total distance of 30 miles. It is reported that some capital has been subscribed locally and that it is expected to start construction early in the spring. E. R. Strathy, Winnipeg, Man., and J. C. Gibson, Toronto, Ont., are interested in this company, which also owns the charter of the Lacombe, Bullockville & Alix Electric Railway.

Phoenix (Ariz.) Railway.—Work has been begun by this company on the reconstruction of its entire line in Phoenix. New and heavier rails will be laid.

Pine Bluff (Ark.) Company.—This company is replacing its old single track on Main Street in Pine Bluff with heavy double track and making other improvements.

***Victoria, B. C.**—The British Columbia Legislature is being asked to incorporate a company to build a standard

or narrow-gage railway, to be operated by steam, electricity or any other motive power, from the international boundary about 9 miles west of the Kootenay River westerly along the river valley to the international boundary where it is crossed by Blue Joe Creek, B. C. F. A. McDiarmid, Victoria, B. C., is solicitor for applicant.

Sacramento Valley West Side Electric Railway, Willows, Cal.—Grading for the first 8 miles of this railway have been completed. It is expected to have the line from Sacramento down the westerly side of the Sacramento River to tide-water at Rio Vista completed as far as the southwestern boundary of the West Sacramento reclamation district by June 1. [E. R. J., Dec. 21, '12.]

Jacksonville (Fla.) Traction Company.—Plans are being made by this company to extend its Lemon Street line in Jacksonville.

St. John's Electric Company, St. Augustine, Fla.—Plans are being made by this company to construct an extension from the present South Beach terminal 1 mile south to the site of the Methodist Assembly.

Georgia Railway & Power Company, Atlanta, Ga.—This company has completed one-third of the grading and has begun the track laying for a 17-mile extension from Atlanta to Stone Mountain. A contract will soon be signed whereby the Fairburn Interurban line, which extends from Atlanta to Fairburn, a distance of 20 miles, will be operated by electric power instead of by gasoline. Power will be supplied by the Georgia Railway & Electric Company.

Alton & Eastern Railway, Alton, Ill.—This company, which is controlled by the East St. Louis & Suburban Company, will begin construction in the spring on its line from Alton to the new hospital east of Alton. Officers: L. C. Haynes, East St. Louis, president; A. J. Purinton, East St. Louis, vice-president, and T. W. Gregory, East St. Louis, secretary. [E. R. J., Jan. 25, '13.]

Northern Illinois Electric Railway, Amboy, Ill.—During the year this company plans to build 20 miles of new track.

Peoria (Ill.) Railway.—Among the improvements planned by this company in the near future will be the extension of its South Adams Street line to the asylum.

Evansville & Southern Indiana Traction Company, Princeton, Ind.—This company has announced through its holding company, the Evansville Public Utilities Company, that it will build a new division from a point several miles south of Princeton to Owensville in the spring. The extension will be 8 miles in length and ultimately is to reach Mount Vernon or New Harmony, Ind.

Kentucky Southwestern Railway, Light & Power Company, Paducah, Ky.—A new steel bridge will be constructed by this company across Mayfield Creek.

Moberly, Huntsville & Randolph Springs Railway, Moberly, Mo.—This company will award contracts in April for the construction of its 12-mile line between Moberly, Huntsville and Randolph Springs; also for three steel bridges. C. H. Dameron, Huntsville, president. [E. R. J., Jan. 18, '13.]

***St. Louis, Mo.**—Plans are being considered to build an electric railway along Hall's Ferry Road to a point opposite Florissant, then west over private right-of-way through Florissant to Bonfils and St. Charles. The right-of-way is being negotiated by J. E. Greffet.

Moncton Tramways, Electricity & Gas Company, Moncton, N. B.—This company has under consideration the building of an extension of 1 mile along Church Street to Sunny Brae and another of nearly 1 mile from the overhead bridge to Main Street, Moncton, N. B. H. N. Price, Moncton, N. B., superintendent.

International Railway, Buffalo, N. Y.—This company has been asked to consider plans to double-track its line through Lockport.

Piedmont & Northern Railway, Charlotte, N. C.—Plans are being considered by this company to build a line between Atlanta and Anderson.

Cape Breton Electric Company, Sydney, N. S.—This company plans to build the following additional lines: From Sydney to New Waterford, N. S., via Grand Lake, 8 miles; from Sydney to New Waterford, via Cow Point, 14 miles; from Dominion to New Waterford, 5 miles.

Cleveland, Alliance & Mahoning Valley Railroad, Cleveland, Ohio.—Work will be begun by this company on its 21-mile line between Ravenna and Leavittsburg as soon as the weather permits. It will connect Cleveland, Alliance, Ravenna and Leavittsburg. [E. R. J., July 27, '12.]

***Jackson, Ohio.**—Plans are being made to build a 40-mile electric railway between Jackson and Portsmouth, via Stockdale and Harrisonville, connecting at this end of the proposed line with the Jackson, Wellston and Hamden Belt Line. The following committee from the three counties through which the road will pass have been appointed: R. W. Allard, S. J. Nickolet and William Bennett, Scioto; Ira Keller, E. E. Balsinger and James Jenkins, Pike, and Dennis Keller, Jackson.

Tri-State Railway & Electric Company, Liverpool, Ohio.—This company has completed its extension from Steubenville, Ohio, to Weirton, W. Va.

Lake Erie & Youngstown Railway, Youngstown, Ohio.—Work will be begun at once by this company on the construction of a 65-mile line from Youngstown to Conneaut.

Niagara, Welland & Lake Erie Railway, Niagara Falls, Ont.—This company has in contemplation the immediate construction of the following lines: From the Grand Trunk Railway, Welland, to Rosedale, 1 mile, and from the Michigan Central Railway, Welland, to Dainville, about 2 miles. T. F. Swayze, Welland, superintendent.

Montreal & Southern Counties Railway, Montreal, Que.—The Board of Railway Commissioners has approved of location plans for the company's line in St. Antoine de Longueuil, Que., to a junction with the Central Vermont Railway, 2.25 miles.

***Oaklawn, R. I.**—Charles B. Westcott and associates plan to build a 3½-mile electric railway from Oaklawn to Apponaug.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—This company announces that it will spend \$50,000 for improvements to its lines in Spartanburg during the year. This will include extension of tracks as well as additions to equipment.

Nashville Railway & Light Company, Nashville, Tenn.—An application for a charter amendment has been filed by this company in pursuance of a resolution passed by the stockholders on Dec. 16, 1912, for the purpose of extending the lines on several streets in Nashville.

Bay Shore Rapid Transit Company, La Porte, Tex.—Plans are being made by this company to begin soon the construction of its line between Houston, La Porte, Velasco and Freeport. Samuel F. George, Dayton, Ohio, is interested. [E. R. J., Oct. 12, '12.]

Orange & Northeastern Railway, Orange, Tex.—Grading will be begun at once by this company north out of Vinton, La. The northern terminus of this 133-mile railway will be Natchitoches, La., and the southern terminus will be East Orange, La., which is across the Sabine River opposite Orange, Tex. Edward Kennedy, Orange, president. [E. R. J., Nov. 23, '12.]

Virginia Railway & Power Company, Richmond, Va.—Construction on the extension of this company's Hull Street line in Richmond will be begun shortly. It will extend from the present terminus along the New Road to the Broad Rock Road.

Charleston (W. Va.) Interurban Railway.—It is reported that this company plans to build a 25-mile extension from Charleston to Montgomery, via Dana, Malden, Levi, Dickinson, Cedar Grove and Hugheston.

Princeton (W. Va.) Power Company.—Plans are in progress for the construction of a 7-mile line between Princeton and Bluefield by this company.

West Virginia Traction & Electric Company, Wheeling, W. Va.—It is reported that this company plans to reconstruct its entire line from Wheeling to West Alexander. New track will be built on Bow Street and the National Road at Fulton, and it will also build a reinforced concrete bridge near Langmeyer's Station in Wheeling.

SHOPS AND BUILDINGS

Pensacola (Fla.) Electric Company.—This company has awarded the contract to build its new carhouse in Pensacola. The structure will be 120 ft. x 63 ft.

Illinois Traction System, Peoria, Ill.—It is stated that this company will begin work next month on the construction of its new passenger terminal station in Peoria. The structure will be seven stories high, the first four to be used as waiting rooms and offices and the others as office suites. The cost is estimated to be about \$350,000.

Lewiston, Augusta & Waterville Railway, Lewiston, Maine.—It is reported that this company, the Brunswick & Yarmouth Street Railway and the Portland Railroad are to consolidate several of their carhouses and will build a new plant in Brunswick, consisting of a large carhouse with a rotary converter and possibly an auxiliary power station.

Moberly, Huntsville & Randolph Springs Railway, Moberly, Mo.—This company plans to build a terminal at Moberly.

Lake Erie & Youngstown Railway, Youngstown, Ohio.—This company plans to build a waiting station, office and freight buildings at Youngstown in the near future. It will also build a carhouse at Conneaut. The structure is to be 140 ft. x 160 ft. and of brick construction.

Ohio Valley Electric Railway, Huntington, W. Va.—This company has begun the reconstruction of its carhouses in West Huntington which were recently destroyed by fire. The new buildings will be built of structural steel with reinforced concrete roofs.

Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis.—Plans are being made by this company to build a new public service building in the business section of Fond du Lac. The structure will be used for a general office building and an interurban depot for passengers and freight.

POWER HOUSES AND SUBSTATIONS

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—This company has purchased from the General Electric Company new substation apparatus comprising 120-kw and 180-kw synchronous motor-generator sets, a 20-kva feeder regulator and three 75-kw transformers and switchboard panel.

Gary & Interurban Railway, Gary, Ind.—This company will install new apparatus in its substations consisting of four 300-kw rotary converters, twelve 100-kw transformers and two switchboards. All the apparatus has been ordered from the General Electric Company.

Toledo & Chicago Interurban Railway, Kendallville, Ind.—This company has placed an order with the General Electric Company for two 300-kw, 600-volt rotary converters, six 100-kw, 2300-370-volt transformers and switchboard apparatus for its power plant.

Iowa Railway & Light Company, Cedar Rapids, Ia.—This company has placed an order with the General Electric Company for one 500-kw, three-bearing motor-generator set and one 500-kw, six-phase rotary converter for its power plant.

Brandon, Man.—A contract has been closed with the Brandon Electric Light Company whereby the company agrees to supply power for the operation of the new municipal electric railway, which is practically completed, at Brandon, at a rate of 2 cents per kw-hr. This contract is to hold good for two years at least, and at the end of four years the city has the option of purchasing the company's plant at its actual value as arrived at by arbitration. [E. R. J., May 4, '12.]

Moberly, Huntsville & Randolph Springs Railway, Moberly, Mo.—This company plans to build its new power plant in Moberly. J. J. Munindger, Huntsville, chief engineer.

Newbern & Ghent Railway, Newbern, N. C.—This company has placed an order with the General Electric Company for a 60-kw generator and a 50-kw two-unit motor-generator set, with 7-kw exciter and switchboard, for its power plant.

Monongahela Valley Traction Company, Fairmont, W. Va.—This company will install in its substations three 300-kw rotary converters, nine 110-kw transformers and three switchboards. The apparatus has been ordered from the General Electric Company.

Manufactures and Supplies

ROLLING STOCK

Tri-City Railway, Davenport, Ia., is said to be preparing specifications for twenty prepayment cars.

Meridian Light & Railway Company, Meridian, Miss., has ordered three cars from the Southern Car Company.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., expects to have built one one-man single-truck near-side car.

Washington Railway & Electric Company, Washington, D. C., has ordered one double-deck car from the Southern Car Company.

North Carolina Public Service Company, Greensboro, N. C., has ordered five double-truck open cars from the Southern Car Company.

Charlotte (N. C.) Electric Railway has ordered material from the Southern Car Company to convert sixteen open cars into center-aisle cars.

Toronto (Ont.) Civic Line is said to be negotiating for the purchase of twenty cars for the municipal lines on St. Clair and Danforth Avenues.

Montreal (Que.) Tramways has placed an order with the Canadian Car & Foundry Company, Ltd., for 100 of its standard car bodies and trucks.

Lake Erie & Youngstown Railroad, Youngstown, Ohio, has ordered from the McKean Motor Car Company one 70-ft., 200-hp motor car and one 200-hp switching locomotive.

Minneapolis & Northern Railway, Minneapolis, Minn., has ordered a 200-hp switching locomotive from the McKean Motor Car Company. The company recently ordered two 55-ft. motor cars from the McKean Motor Car Company.

Western New York & Pennsylvania Traction Company, Olean, N. Y., has ordered from the Wason Manufacturing Company one single-truck semi-convertible car, one express car mounted on Brill 27-MCB trucks and one extra pair of trucks.

Louisville & Northern Railway & Lighting Company, New Albany, Ind., has had two trail cars rebuilt by the Jeffersonville Car & Foundry Company. They have been equipped with steel sides and steel underframes, and the steps have been lowered.

Chattanooga Railway & Light Company, Chattanooga, Tenn., has ordered from The J. G. Brill Company four 45-ft. 1-in. semi-convertible center-entrance Jim Crow car bodies mounted on Brill 27-MCB-1 trucks, one 40-ft. baggage-express car mounted on Brill 27-MCB-1 trucks, also two extra Brill 27-MCB-1 trucks.

Stone & Webster, Boston, Mass., have placed an order with the St. Louis Car Company, through Wendell & MacDuffie, New York, Eastern representatives, for forty-four cars. The order is distributed as follows: Dallas (Tex.) Consolidated Electric Street Railway, ten double-truck city cars; Houston (Tex.) Electric Company, ten double-truck city cars; Northern Texas Traction Company, Fort Worth, Tex., ten double-truck city cars and four interurban cars; Jacksonville (Fla.) Traction Company, ten double-truck city cars. The city cars are all of Stone & Webster standard steel T-post construction.

TRADE NOTES

H. W. Johns-Manville Company, New York, N. Y., has opened a branch office in the Dooly Block, in Salt Lake City, Utah. The company has recently removed its Newark office to 239 Halsey Street, Newark, N. J.

W. N. Matthews & Brother, St. Louis, Mo., announces that its New York office is now located at 50 Church Street. Warren M. Heim, sales engineer of the company, is in charge of the New York office and has charge of all the territory from Maine to North Carolina.

McKean Motor Car Company, Omaha, Neb., has received an order from the Sunset Central Lines for five 70-ft. motor cars, which are assigned to the following lines: Morgan's Louisiana & Texas Railroad & Steamship Company, Gal-

veston, Harrisburg & San Antonio Railway, Houston & Texas Central Railroad.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received the following orders for railway motors: Cumberland Electric Railway, Cumberland, Md., fourteen No. 92-A motors; Pensacola Electric Company, Pensacola, Fla., eight No. 92-A motors; Lynchburg Traction & Light Company, Lynchburg, Va., four No. 101-B2 motors and K-28-B control.

Stewart Hartshorn Company, Newark, N. J., has passed the half-century mark in the manufacture of curtain rollers. For more than fifty years this company has maintained the highest possible standard of quality in curtain roller construction, and has been constantly on the alert after exhaustive tests to adopt improvements. This policy has made the name Hartshorn an assurance of satisfactory operation, either in a spring roller or a sash balance.

Western Electric Company, New York, N. Y., has placed upon the market a new dry battery to be known as the red label blue bell battery. It is incased in a red carton and is designed for intermittent service requiring high efficiency and rapid recuperation. The battery is of the high initial amperage and low internal resistance type, having an initial amperage of 25 amp on short-circuit. These characteristics, together with its powers of rapid recovery after use, insure its long life and usefulness wherever this general type of battery is required. The battery may be used for the operation of call bells and annunciators, for operating telephone pole changers, for railway telephones in furnishing transmitter current or train dispatching circuits, as selective signaling battery or in operating No. 62 type interrupters. It is also specially fitted for ignition service in general, in conjunction with all types of industrial gas engines.

ADVERTISING LITERATURE

Chicago Pneumatic Tool Company, Chicago, Ill., has printed Bulletin No. 124 on pneumatic riveting, chipping, calking and stone hammers.

MacGovern & Company, New York, N. Y., have issued their February list of second-hand electrical and steam machinery, cars, car equipments, etc.

Nazel Engineering Works, Philadelphia, Pa., have issued a twenty-page catalog which fully describes and illustrates Béch  patent forge hammers.

Trigger-Lock Reversible Controller Finger, Niagara Falls, N. Y., has issued a circular which calls attention to the merits of trigger-lock controller fingers.

Trolley Supply Company, Canton, Ohio, is mailing a folder which calls attention to the merits of the Peerless No. 10 trolley base for high-speed interurban cars and the Star trolley base for city cars.

G. L. Simonds & Company, Chicago, Ill., have issued a sixteen-page catalog which briefly describes and illustrates Simonds fuel economy specialties, including Hays flue-gas analysis instruments, Hays differential draft gages, Vulcan soot cleaners, Dean boiler tube cleaner, Robertson check and pump valves, Eclipse smoke indicator and Little Giant tube extractor.

Philadelphia Equipment Securities Company, Philadelphia, Pa., has issued a booklet "Equipment Trust Certificates as Applied to Financing Purchases of Cars by Electric Railways," in which it describes briefly the methods to be followed by the company in financing the purchase of electric railway cars by equipment trusts which have been used so extensively by steam railroads for many years.

The J. G. Brill Company, Philadelphia, Pa., has just issued *Brill Magazine* in bound form for 1912. It is the intention of the company to send out such volumes each year. This magazine is now in its seventh year, having started in January, 1907, with a circulation of 2000 copies, which has grown to over 7000. This circulation is made up entirely of the chief officials of electric railways throughout the world, the heads of engineering departments of universities and technical schools, technical libraries, editors of railway publications and the railway editors of the principal newspapers.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. 48,500, which fully describes and illus-

trates G. E. Edison Mazda lamps for standard lighting service. The company has also issued Bulletin No. A4080, which is devoted to the use of electricity in excavation and construction work. The bulletin deals with both the generating of the current and its use through motors. It touches on the advantages to be derived from the use of electric power and refers briefly to its application to the work in connection with the Panama Canal, Catskill Aqueduct, New York Barge Canal and in general construction.

NEW PUBLICATIONS

Handbook on Incandescent Lamp Illumination, 1913. Published by the General Electric Company, Harrison, N. J. Price, 50 cents.

This is the first handbook of the kind to be published by the General Electric Company. In preparing the book the object has been to provide a reference book for those interested in incandescent lamps and in problems dealing with incandescent lamp illumination. With this in view there have been included tables and formulas covering the various problems that may present themselves to the central station man, to the lamp solicitor, to the student and to the user of incandescent lamps. The handbook is pocket size, contains 148 pages and is bound in leather.

Proceedings of the Keystone Railway Club. Published from the office of the secretary, J. G. Baukat, Allentown, Pa.

The proceedings of the Keystone Railway Club covering the meetings held at Harrisburg June 25, 1912, and Scranton, Pa., Sept. 10, 1912, have just been issued in convenient pamphlet form. The text is printed on rough stock, but the halftone illustrations are effectively displayed by the use of coated paper. The publication contains the following papers: "Relation of the Equipment Department to the Traffic Department," by C. M. Paxton; "Shop Management and the Handling of Repairs to the Best Advantage," by Henry Branson; "Preparation of Equipment for Summer Business," by William H. Wheaton; "Car Ventilation," by William J. Fleming, and "Development of Control Apparatus," by J. J. Sinclair. The minutes of the various meetings and a complete list of the officers, committees and members are also included.

Proceedings of Southwestern Electrical & Gas Association. Published from the office of the secretary, H. S. Cooper, Galveston, Tex.

The Southwestern Electrical & Gas Association has issued a handsome cloth-bound volume of about 250 pages covering the proceedings of the seventh annual convention held at Houston, Tex., April 27 to 29, 1911, inclusive. The proceedings for 1912 are now in the hands of the printer and will be sent to members within a short time. Among others, the 1911 proceedings contain the following papers of electric railway interest: "Boiler Economy and the Application of Flue Gas Analysis," by M. L. Hibbard; "Investigation and Care of Return Railway Circuits," by E. E. Nelson; "Cause and Prevention of Accidents," by C. W. Kellogg, Jr.; "Development of Power Business," by P. A. Rogers; "Light Weight Cars, Their Construction and Operation," by R. T. Sullivan. The question box also includes much matter of value to electric railway operators.

Electric Railway Diary. Published by *Light Railway & Tramway Journal*, London, England.

An annual feature of the *Light Railway & Tramway Journal*, London, England, is the distribution among its subscribers of a cloth-bound diary 18½ in. x 13 in. in size. The diary is always accompanied by a calendar, miscellaneous useful information on such matters as postage rates, telegraphic service, tables of measurements, etc., and a selection of the most interesting electric railway papers of the year. Among the latter in this issue of the diary are articles on the corrugation of rails, track maintenance, steel car wheels of M. C. B. standard, steel-tired wheels and axles, the use of meters on cars, depreciation and sinking fund, advantages of prepayment of fares to tramways and the traveling public and the authorization of trailer operation in London. A directory of the personnel of British electric tramways, of the London offices of foreign tramways, of Belgian interests in such tramways and of colonial, Indian and foreign railways with business connections in London is also included.