Electric Railway Journal

Vol. XLI NEW YORK, SATURDAY, APRIL 26, 1913 No 17

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.

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

Of this issue of the ELECTRIC RAILWAY JOURNAL, 8100 *copies are printed.*

CULTIVATION OF UNUSED RIGHT-OF-WAY

On an electric railway which owns right-of-way sufficient for double track but has only a single-track line the unused width of the right-of-way is apt to prove somewhat of a nuisance from the operating point of view. Either it becomes unsightly through a growth of weeds which encroach upon the track, or in a dry country it becomes dusty and the dust is drawn into the cars by the passage of the train. The only obvious alternative, the cultivation of the right-of-way by the planting of grass, is expensive. This problem has been solved, however, on some of the Far Western roads by still another method. This is the temporary lease of the unused land on the right-of-way to the farmers along the line. Sometimes a nominal rent is charged; at other times the use of the land is given to the abutting property owner under the condition that he will keep it in cultivation. While the width of the strip is not great, its total area when it lies alongside a large farm is considerable, and where the adjoining land is productive the arrangement is usually welcomed by the farmer, who can thus continue his planting across the division line and right up almost to the track. The method, therefore, works out to the satisfaction of both parties, and when the ground is needed later for railway purposes its possession can be re-assumed.

SENIORITY RIGHTS IN THE CHOICE OF RUNS

Two years ago in a majority report a committee at the A. E. R. A. convention approved the application of the seniority principle for the selection of runs by platform men. Considerable opposition developed at the time, and apparently much of this is still in existence. No definite recommendation was made regarding the rigidity with which the plan should be followed, yet it is certain that such limited advantages as the principle affords to the railways were emphasized by the elimination of qualifications in the report. It is, of course, true that an agreement by a railway company to observe a rigid rule that platform men shall have a choice of runs in accordance with their lengths of service presents the men with "rights" which may at times prove embarrassing. But the man who is assured of his choice of runs after he has earned it by a sufficient length of employment is by no means as likely to throw up his position and privileges because of a minor disagreement or temporary fit of irritation as is one who feels that his rights are subject to abrogation by an arbitrary decision of his superior. Since the street railway industry suffers to a remarkable degree from the lack of old and experienced employees, the elements of advantage due to rigid seniority rules would seem to balance to no inconsiderable degree the objectionable features. No better example of this can be found than upon the steam railroads, where the locomotive engineers' "seniority rights" are so jealously guarded that they have become actually inviolable. Yet this very feature binds every locomotive engineer to the railroad with which his service was commenced and leaves him, after the expiration of a few years, practically without any incentive to obtain similar employment elsewhere.

PREPAYMENT POSSIBILITIES ABROAD

The inauguration of prepayment car service within the past twelve months at Gateshead and Aberdeen, its more recent introduction at Leicester and the experiments with separate entrances and exits which are now under way at Liverpool foreshadow a change in European methods of fare collection which may prove as radical as our own. At first sight it would seem that the present foreign custom of giving the passenger a receipt which must be displayed to an inspector upon demand should be ideal for securing all of the fares. In practice, however, it is quite as easy for a passenger to avoid paying the proper fare or any fare at all as it is on other non-prepayment cars. Over-riding is the crying evil of cities with zone fares, but even where a straight fare obtains, as in Berlin, it is possible to deceive the forgetful conductor of a crowded car by prominently showing a fare receipt which has been received upon a previous trip. On the other hand, some conductors do not scruple to pick up discarded receipts which they pretend later to tear from their serially numbered pads. In Milan an endeavor is being made to limit these practices by the use of different colors for the incoming and outgoing cars, but any attempt to go further than this would appear to be impracticable. In Zurich the conductor is expected to tear the fare receipt almost completely in two, but elsewhere the custom is merely to punch the ticket or to tear off a small portion. Of course, the possibility always exists that an inspector will board the car to see if the passenger receipts correspond to the date.

line, conductor's number, serial number, etc., but this no more prevents theft utterly than do register checking and passenger counts in this country. As a matter of fact, one may ride on European tramway cars a score of times without seeing any inspector whatsoever. The foregoing recital of actual conditions shows that European street railways also have good reasons for seeking improvements in fare collection. Prepayment development abroad will doubtless follow different lines from our own because of the zone systems, but when the movement has once gained its proper momentum we may expect to see repeated in Europe the same wonderful advance in rolling stock design and operation which has characterized the evolution of the prepayment car in Canada and the United States.

CONTROL CIRCUITS OF STORAGE BATTERY CARS

The return of the storage battery car as a factor in some fields of railway service has revived the query as to why the resistance losses should not be eliminated by substituting parallel connection of the batteries at starting for straight series connection. This has always been an interesting problem in view of the fact that a possible saving in energy is relatively more important to a storage battery car than to one which receives energy from outside.

The point made by the inquirers is that the speed should be built up by successively adding cells or groups of cells instead of gradually cutting out resistances from a full-voltage series or series-parallel circuit. A little consideration of the practical conditions, however, will show that the change from the standard control is not worth while unless regeneration of energy on down grades is a factor. It is true that there would be a theoretical gain if the cells were connected into circuit gradually with increasing speed, but this would cause a variable discharge in the different cells which would have to be taken into account on charging. In this case the connections would be analogous to those of a stationary battery with a number of end cells and an end cell switch, and the care of such a battery would require a skilled attendant. The eight to ten stops per mile of a car in city service do not involve such great resistance losses as to justify this complication.

Even the smallest accumulator cars have two-motor equipments, and their standard controller connections provide for starting the motors in series on the first steps and in parallel on the last steps. This gives the same effect as would be obtained by connecting the battery in two halves in parallel. Very little would be gained by applying less than half voltage to the motors, as the principal losses occur when the motor connections are changed from series to parallel. The problem is, in fact, similar to that of a four-motor car and except in very special cases, as where heavy locomotives are required to have a very wide range of speed, the controller connections do not permit starting with four motors in series. Furthermore, in automobile trucks equipped with a single motor the present general practice is to keep the battery in series and secure control by a series-parallel arrangement of the field. The reduced efficiency of a motor operated on less than its normal voltage seems to offset largely any losses encountered in the unit-voltage method.

So far as is known, all of the present American single accumulator cars have their batteries connected in straight series, although in early days the series-parallel connection was tried. It is interesting to observe that in 1907 the Prussian State Railroads purchased a storage battery car for service at Limburg in which the use of starting resistances was avoided by subdividing the battery, and energy was returned to the battery on down grades by using four shunt-wound motors with regenerative control. It was found that the regulating devices necessary to secure the correct operation of the motors on this car were very complicated. However, five cars with a simplified regenerative control were ordered in 1910, and these were placed on lines where the grade conditions make regeneration a factor of importance. In general, it may be said that the control system of the modern accumulator car with series motors is as efficient as simplicity and reliability in operation permit.

ELECTRIC RAILWAY EXPRESS STATION DESIGNS

On most electric railways where an express and freight handling business has been developed within recent years rigid economy in the design and construction of stations and equipment has been a necessity. Managers have done wisely in leaving to the future the completion of extensive plants for the quick and economical reception and delivery of merchandise, but it is a question if more might not be made of the available facilities in a good many instances. Close study of a number of electric express stations during the past year inclines one to the idea that, except in the matter of size, the securing of a highly efficient installation is not much more costly than the establishment of a mediocre outfit, except perhaps in some cases where old buildings have to be used on unfavorable and greatly restricted sites.

It would be rash to attempt to lay down any general design for this class of service, but certain features of the best stations of moderate cost may well be outlined. Referring chiefly to the design of express terminal stations, nothing is of more importance than adequate lighting, both of the natural and the artificial type. Plenty of tungsten lamps of the 40-watt or 60-watt size equipped with reflectors throwing the illumination downward upon the shipping floor are a cheap but vitally important accessory to the rapid transferring and weighing of merchandise, the avoidance of errors in reading tags and bills of lading and the reduction of eye strain to the minimum. The character of the incandescent lighting in force even at this late day in some installations is almost below criticism, and it ought not to be necessary to set forth here the futility of trying to handle merchandise efficiently with a few old-fashioned carbon-filament lamps swinging from the rafters of an ancient shed in the proportion of say one lighting unit to every 300 or 400 sq. ft. of floor area. Even in cases where a local express organization handles the goods at the station, the railway company should realize that the full capacity of its express car bodies and motors may be largely offset if the flow of merchandise is throttled in its passage to and from the cars. Along this line, therefore, the provision of a paved approach and exit for teams and trucks serving the

platforms is a good investment, as well as the arrangement, so far as possible, for separate inward and outward trucking movements. Where parallel storage tracks are available at the side of the building, provision for the simultaneous loading or discharge of as many cars as possible by the use of plenty of gangplanks should not be overlooked. Here again ample artificial lighting is desirable, particularly at stations shipping or receiving milk and other farm products during the night or early morning.

Other desirable points cover the arrangement of the foreman's office overlooking the shipping department, provision of lockers and modern lavatory facilities, the installation of wooden guard rails or bumpers at the walls, platforms and doors so that trucks cannot chip off pieces of the building, use of concrete flooring, or at least the employment of this material for a floor foundation, and the installation of platform scales at one or more points where goods can be handled with minimum lifting. As the business increases, it may pay to consider the installation of power hoists and telpher equipment—something with which very few express stations are as yet provided. Depots of this kind are as yet of comparatively small size, but it is not improbable that as this business grows the distances to be covered in hand trucking may justify the purchase of one or two electrically operated baggage trucks where the volume of merchandise to be handled is sufficient to warrant the investment.

"A SERIOUS BLOW TO ARBITRATION"

The words above are used by the international president of the Amalgamated Association of Street & Electric Railway Employees to characterize the outcome of the arbitration in the case of the dispute between the Chicago City Railway Company and its employees. But this mild phrase does not adequately express the feelings of President Mahon, who says further of the majority decision of the board: "It is the same old rot and corporation contentions that I have listened to for twenty-one years as an officer of this association, and the award of Carter and Fleming is in line with these fossilized opinions." The minority member of the arbitration board uses less strenuous language, but his dissenting opinion, or rather his criticism of the majority opinion, is about 8000 words in length and emphatically disagrees with every feature of the award and with the reasoning that led up to it.

We have no desire to go into the merits of the Chicago arbitration and its results, but it is worth while to examine some features of this arbitration and the spirit in which the award was received in their relation to the whole question of the arbitration of labor disputes. It has long been a privilege of the defeated litigant to "cuss the court," but rarely has there been a more impressive exhibition than this case affords of how a compromise may accentuate rather than lessen the dissatisfaction of those who sought a settlement by arbitration in the first place.

Judge Kickham Scanlan was selected by the employees to represent them in the arbitration. The company designated Harvey B. Fleming as its representative. Judge Scanlan suggested as the third member of the board Judge Orrin N. Carter, of the Illinois Supreme Court. An enormous amount of evidence, consisting of some 3500 typewritten pages and more than 200 exhibits, was introduced. The very volume and completeness of the testimony, however, seem merely to have multiplied the opportunity for differences of opinion, and after reading the statement by Mr. Fleming and the dissenting opinion by Judge Scanlan one is prepared to accept the latter's statement that "this case proves one thing clearly, and that is that you can find statistics to prove anything." And, notwithstanding the high character of the arbitrators, the fairness of the method of their selection from the employees' standpoint and the care with which they investigated the matter referred to them, the losing side now declares that the award is "rot" and that arbitration has received a serious blow.

As a matter of fact, arbitration of the kind exemplified in the Chicago case needed a blow, not for the reason that in this case it happened to result in an award unsatisfactory to the employees, but because it is a farcical, unfair and much abused method of attempting to settle labor disputes. Arbitration is a complete misnomer for a proceeding in which two so-called arbitrators have made up their minds before investigation of the case begins and in which the office of the third arbitrator is to bring about some kind of a compromise between the extremes represented by his co-arbitrators. At the very best this is no more than a makeshift to avoid strikes. It seldom results in justice or decisions resting on the weight of evidence or the merits of the case presented. And when the award does rest on the merits of the case, as it appears to do in the Chicago case, the declaration is made that arbitration is discredited.

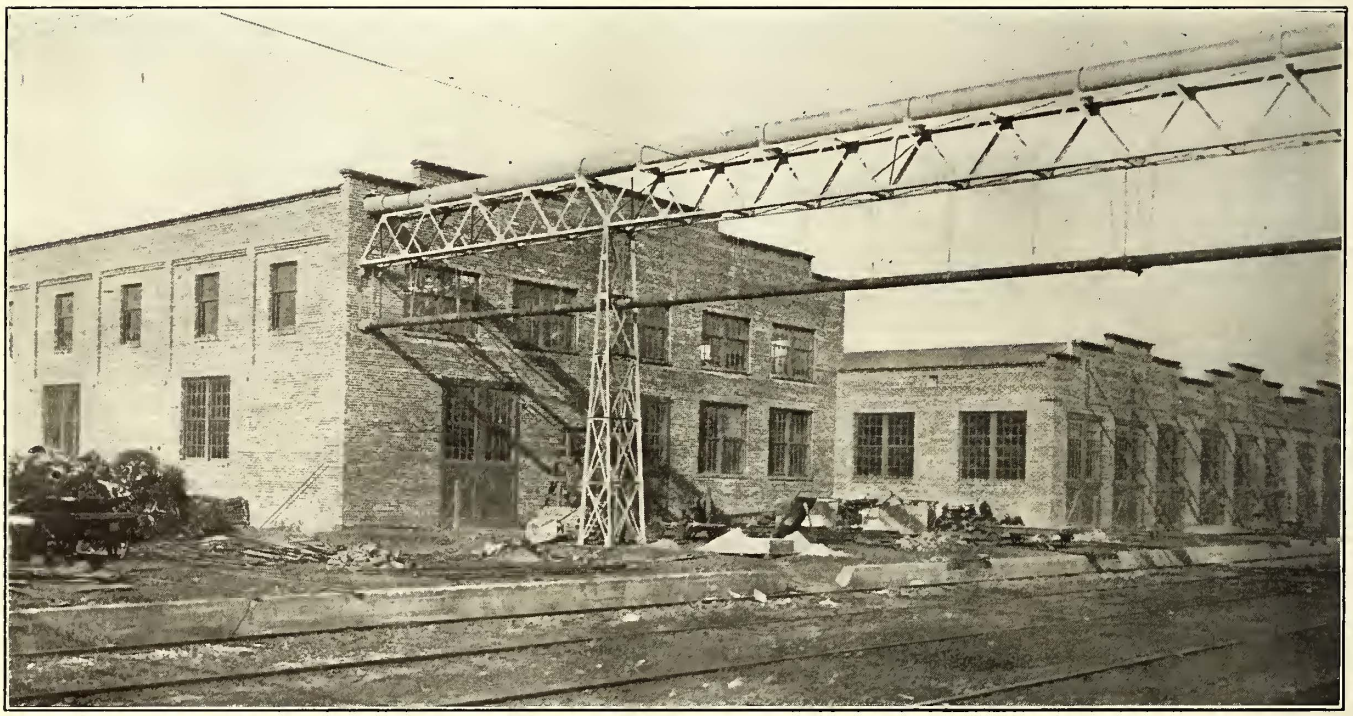
In the criticisms of the Erdman act recently made by the steam railroads it has been very forcibly pointed out that there cannot be a judicial decision in a labor dispute of any great scope unless there are a considerable number of disinterested arbitrators on the board. Cases at law involving only a very trifling proportion of the sum concerned in an arbitration on wages are tried before a jury of twelve men because that number is considered more likely to take a fair and judicial view of the matters under consideration than one man. Moreover, a decision made by a number of men acting in this way carries much greater weight than that of a single man. We do not mean that an arbitration board should consist of twelve men, but it should contain more than one disinterested umpire and should be a board of arbitration in fact as well as in name. Hence we believe that the arguments made by the steam railroads in favor of a larger number of disinterested arbitrators under the Erdman act are sound.

Arbitration always has an agreeable sound to a community that is inconvenienced or in fear of being inconvenienced by a strike. But if a consistent effort were made by electric railways to convince the public that arbitration, as it works out in most electric railway controversies, is merely a measure of coercion directed against the company to force it to great demands not justified by the merits of the case, and that continual surrender to this form of coercion will ultimately produce results far worse than the inconvenience of a few days' strike, there is reason to hope that so-called settlements of labor troubles by arbitration as it is usually practised would lose the popularity they now enjoy.

New Woodworking Shop of Omaha & Council Bluffs Street Railway

A Detailed Description of Building Construction and Arrangement of Woodworking Tools as Well as the General Shop Layout

In planning the general repair shop layout of the Omaha & Council Bluffs Street Railway future extensions received unusually careful consideration, because existing requirements did not demand a large shop building, although prospects indicated that increased shop capacity would become necessary at an early date. The first shop building was constructed on property sufficient in size to allow for ample additions, and these were planned in a tentative way at the time of construction. A shop building, 120 ft. x 245 ft. in plan, and an adjoining building for offices and heating plant were built in 1907. These gave ample capacity for existing requirements and allowed space for additions to the machine tool equipment from time to time. A short time ago it became evident that at least one of the contemplated extensions would be necessary and a new wood mill and erecting shop has been built.



Omaha Wood Shop—View of New Wood Mill and Repair Shop Showing Method of Supporting Shavings Exhaust Duct

The original layout included a transfer table giving maximum outside storage capacity on the vacant property and facilitated movement of cars through the original shop building. At the same time the transfer table was so located as to serve future shop buildings, so that there was no difficulty in selecting a site for the new building. This was constructed on the opposite side of the transfer table pit from the old shop building. The space allowed for the transfer table and track approaches made it necessary to locate the wood shop 80 ft. from the old shop building, with the wood mill and erecting shop approximately opposite the paint shop section of the original building.

Plan and Construction Details of Wood Shop

The general plan of the wood shop includes a two-story mill room, 80 ft. x 112 ft. in size, which adjoins the erecting shop, 134 ft. x 144 ft. in size. This latter portion of the building is divided into two sections separated by a 17-in. fire wall. The larger bay, which is approximately 90 ft. wide, will be heated and used as an erecting shop, and the smaller section, which is 45 ft. in width, is used to provide additional carpenter and paint shop capacity when required. The building is constructed on concrete foundations, with 17-in. common brick exterior walls and partitions. Structural steel columns and floor beams support the balcony in the mill room, and the built-up steel trusses resting on the columns and building walls support the roof throughout. The first floor in both the mill room and the carpenter shop is of concrete with a sidewalk finish, and the floor on the balcony is of dressed and matched 2-in. x 6-in. yellow pine.

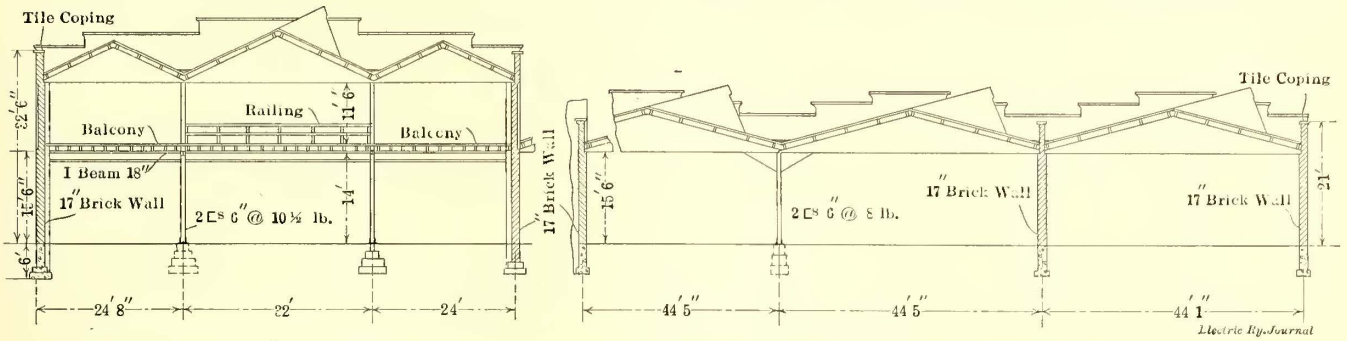
The mill room is divided into three bays which permitted the construction of balconies over the two outside bays with saw-tooth skylights over the central bay. The roof over the carpenter shop and storeroom is supported on three trusses arranged for three saw-tooth skylights. These skylights are continuous over the five central panels in the mill room and the seven central panels in the carpenter shop. The liberal spacing of twin windows on both the first and second floors of the mill room as well as the carpenter shop, in addition to the skylights, provides excellent natural illumination. The roof proper is built of 2-in. matched sheathing on wooden purlins and covered with Barrett's "Amazon" composition roofing. All flashing is of sheet lead and drainage is provided by sloping each of the valleys to two down-spouts which lead down along the building columns to the shop drainage system.

Two tracks lead into the mill room from the transfer table pit, one passing entirely through this section to the dry kiln in the rear. Nine tracks lead into the carpenter shop, extending for the full length of the building. These are spaced on approximately 14-ft. centers throughout. The tracks enter the building through 10-ft. openings provided

with swinging one-sash doors. In order to provide continuous overhead trolley contact over the space between the transfer table pit and the carpenter shop, structural steel brackets attached to the roof framing extend out over the center of each door to meet the stub end of the trolley on the transfer table.

The new wood shop is supplied with heat from the central heating plant in the old shop, which was made sufficiently large to take care of the additional radiation necessary to heat the new building. The heating system is of the indirect type, the steam-heating coils and a 6-ft. fan being installed in one corner of the mill room. Hot-air ducts are carried overhead on the floor beams of the second floor of the mill room and roof trusses of this portion of the building, as well as in the carpenter shop. The steam is carried into this building through a heavily insulated main supported on a structural steel bridge and is thus carried over the transfer table. The bridge also supports the shavings exhaust duct for removing sawdust and refuse from the mill room.

Artificial light is provided by arc lamps which are swung from the floor beams and roof trusses and spaced to give a uniform illumination at the working level of the machine. Individual lighting is provided as needed by tungsten lamps swung from drop cords. Both the mill room and the carpenter shop have been equipped with a dry sprinkler system. The water supply for this system as well as that in the old shop building is taken from the city mains. Other means of reducing fire hazard include a 17-in. brick partition wall and double fire doors built under the underwriters' specifications. The latter, in case of fire, automatically close the two openings between the mill room and the carpenter shop.



Omaha Wood Shop—Cross-Section Through Wood Mill and Erecting Shop

WOOD MILL

As mentioned previously, the wood mill is two stories in height, the mill room being on the first floor and the cabinet shop occupying the balcony on the second floor. A 2-ton electric freight elevator operating at 25 ft. per minute was installed to handle material between the two departments. The woodworking machine installation includes the following: a circular cut-off saw, small joiner, 4-in. molder, 10-in. molder, a tenoner, a plain mortiser, a hollow chisel mortiser, a shaper, a 26-in. planer, a circular rip and cut-off saw, a swing saw, a band saw, a sander and an emery wheel for sharpening tools.

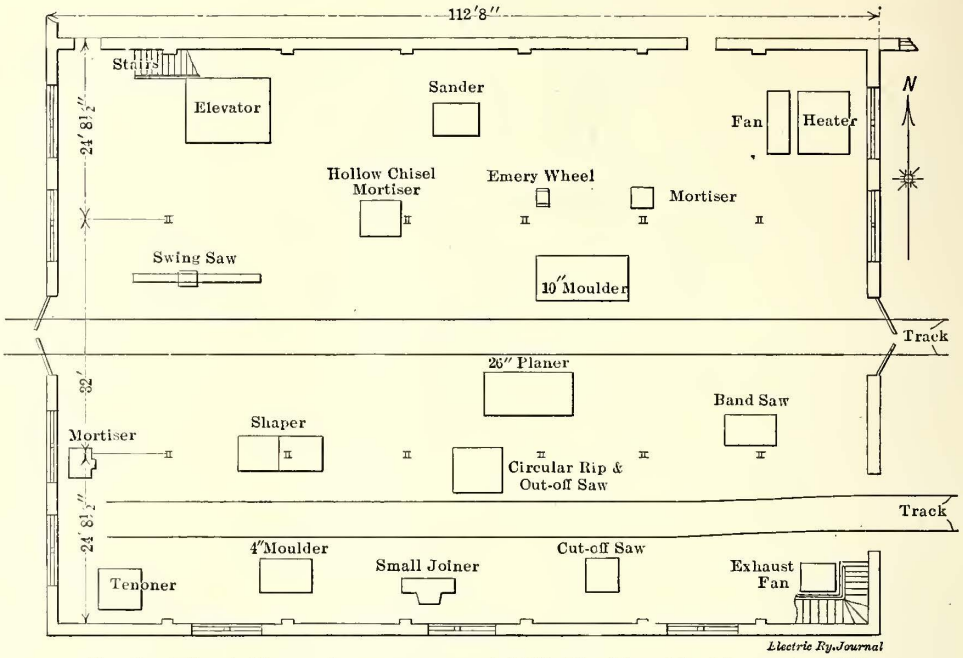
Omaha Wood Shop—Interior View of Wood Mill from First Floor, Showing Balconies Along Both Sides

The shavings and sawdust are removed from all machines

by means of an exhaust duct system. The fan delivers the shavings and sawdust to a discharge duct which is carried on a bridge over the transfer table pit to the boiler room about 200 ft. away. Situated conveniently about the shop and at the floor level are several rectangular intakes or floor sweeps into which is swept all refuse material collecting on the floor.

Individual motor drives have been installed for practically all the woodworking machines, and this made it possible to install the machinery to the best working advantage. The resulting elimination of long line shafting also permitted a considerable reduction in the structural steel frame which supports the balcony. The small cut-off saw and the rip saw in the cabinet shop on the balcony are driven by the motor which operates the sander on the first floor by means of a jack shaft supported beneath the balcony floor.

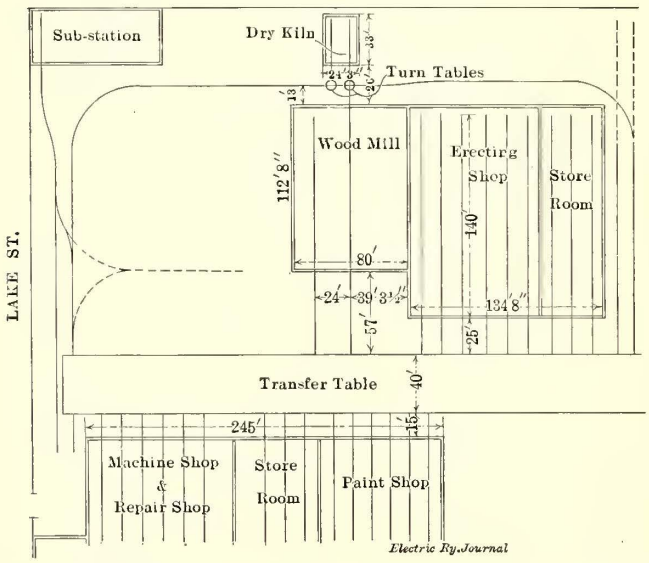
The individual motors were installed as near as possible to the machines which they drive, and in every instance the motor control is mounted either on the machine or so close to it that there is no time lost in cutting it in or out of service. Most of the wiring is installed in conduit under the floor which also serves to carry the lighting circuits.



Omaha Wood Shop—Arrangement of Mill-Working Machinery in Mill.

Each machine in the wood shop received special attention with a view to providing protective devices for the workmen without interfering with efficient operation. In most instances sheet-steel hoods are provided over the motors and driving pulleys and shields have been installed at all other dangerous points.

The installation of the two tracks in the wood mill permits all longitudinal movement of heavy material to be handled by a push car. This push car is also used in handling material to and from the dry kiln by way of the large entrance door at the rear of the mill room building. Transverse movements of material are handled by means of two-wheeled trucks, which also serve in moving material from the mill room to the cabinet shop by way of the electric elevator.



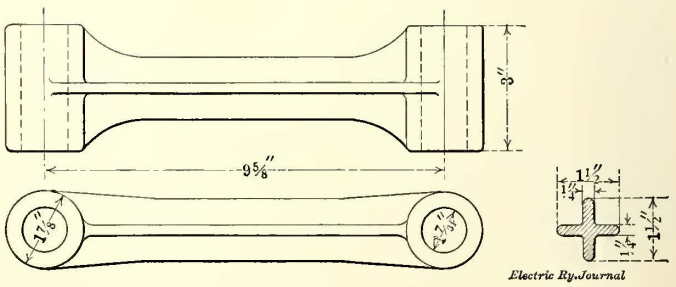
Omaha Wood Shop—General Arrrangement of New Building

The erecting or carpenter shop required no special machine tools. Workbenches arranged along the building walls and a complete set of air-driven tools, such as drills, chisels and hammers, were included in the equipment. The work in this department is confined to assembling the car bodies preparatory to painting (although priming coats of paint are usually applied here) and installing the interior fittings after the finishing coats of paint have been applied in the paint shop. Both the wood mill and erecting shop are especially busy at the present time building new double-truck cars of the pay-as-you-enter type as well as overhauling and standardizing the old rolling stock.

The work of designing the wood mill and carpenter shop as well as of planning the general shop layout was handled by the engineering department under the general supervision of T. E. Woods, master mechanic, Omaha-Council Bluffs Street Railway Company.

A LIGHT-WEIGHT BRAKE HANGER

A saving in weight of brake rigging of nearly 50 lb. per car has resulted from the adoption by the New York State Railways, Rochester Lines, of the form of hanger shown in the accompanying figure, which was designed by G. M. Cameron, master mechanic. On the basis of a cost of 5 cents a year for hauling a pound of car weight, this reduction saves $2.50 annually per car. The hanger is so proportioned as to utilize the steel to the best advantage. All bearings are easily replaceable hardened-steel bushings, so that, except for breakage, the life of the hanger is unlimited.



Light-Weight Brake Hanger for Rochester City Cars

Municipal Railway Line in Seattle

An Account of the Equipment of the Municipal Electric Railway Which Has Recently Been Built in Seattle, with Some of the Events Which Preceded Its Construction

The city of Seattle has had under construction during the past year a municipal street railway which has a length of single track of 7.88 miles. The line extends from the corner of Stewart Street and Third Avenue West along the shore of Lake Union and Lake Washington Canal to the northwestern part of the city, as shown in the accompanying map by the solid line. The track construction is largely completed but the overhead work has not been erected. The first four cars for operation on the line are due in Seattle May 1. The line has been built under the direction of the Department of Public Utilities of Seattle, and the route was selected so that it would form a continuation of the Seattle, Renton & Southern Railroad, which is at present in the hands of receivers and which the city hopes to purchase.

HISTORY OF MUNICIPAL ELECTRIC RAILWAY IN SEATTLE

The history of the municipal railway in Seattle dates from January, 1911, when the City Council passed an ordinance providing for the submission to the electors of authority to issue bonds to the extent of $800,000 to construct the line and also to purchase by condemnation "any existing electric railways, private right-of-way, track or tracks, or the facilities and appurtenances, or any of them, in the judgment of the Board of Public Works suitable and necessary for use as part of the electric railway system." This later provision was intended to cover the system of the Seattle, Renton & Southern Railway with 9.8 miles of track within the city limits. The bonds to be issued were to be general bonds of the city of Seattle, payable twenty years from the date of issue and to bear not to exceed 4½ per cent annually. An affirmative vote of three-fifths or more of the qualified voters in the city of Seattle voting on the said proposition was necessary to carry the proposition. This ordinance was signed by Mayor H. C. Gill on Jan. 10, 1911, and it was officially published three days later. The ordinance created the post of superintendent and made A. L. Valentine, superintendent of public utilities, the head of the municipal railway system.

At the election held March 7, 1911, 25,634 votes, or 63.47 per cent, were cast for the bonds, and 14,754, or 36.53 per cent, against the bonds, a total vote of 40,388. In the same municipal election, which was bitterly contested, between 20,000 and 25,000 more votes were cast for the heads of the opposing tickets than for the bonds. The ordinance called only for a three-fifths vote, and the bonds were therefore carried.

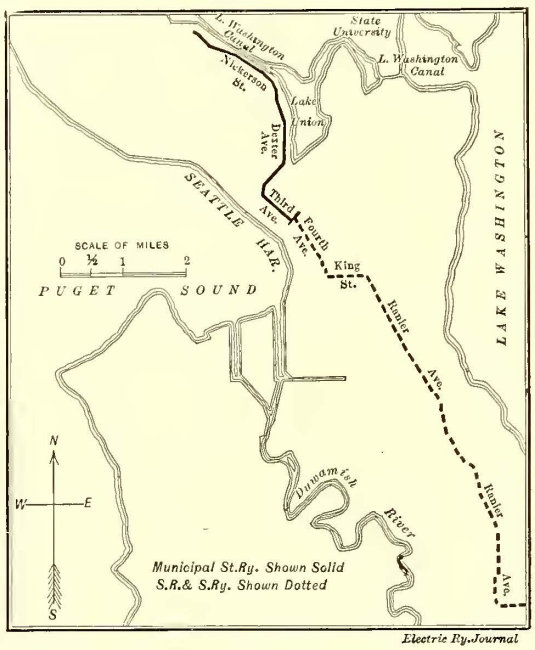
Under the terms of the ordinance and the bond issue correlatively, the Seattle, Renton & Southern Railway, from Third Avenue and Stewart Street, its northern terminus in the business section, to the southern city limits was to be taken over by the city as a part of the proposed municipal line, by condemnation. The city was first to appraise the property and make the Renton line an offer. Sixty days were given by the city to the company in which to accept or reject its tender. In the event of refusal the city was to proceed in court to force condemnation.

NEGOTIATION WITH THE SEATTLE, RENTON & SOUTHERN

The Board of Public Works, acting within its authority, offered the Renton line $386,053.59 for the entire line and equipment. The offer was refused. President W. R. Crawford, of the Renton line, replied with a counter proposition as provided in the ordinance, in which he offered the city common user rights on the same terms as are usually arranged under similar conditions.

Shortly thereafter ex-President Crawford, who had been deposed by a reorganized board of directors, sought a receivership in the state courts. He secured possession for two days under the court order, when the bondholders took the case into the federal courts and secured an order appointing two of their men as receivers. President Crawford appealed to the federal courts and obtained an order throwing the entire receivership back into the state courts, and two of his representatives were appoined receivers. These men are still in charge.

About three months ago Peabody, Houghteling & Company, acting for the bondholders, appeared before the City Council and requested it to submit to the people a proposition carrying the conditions of what is now known as proposition A. This plan provided generally that the city should share 50 per cent of its net earnings, participate in its management and audit all bills. It further provided that the city would have the right to purchase the line by giving not less than three months' notice. The proposition submitted by the bondholders to the city was put to a vote on March 4, 1913, and received a majority of 882 votes on a total vote on the proposition of 35,412. The proposition contained the provision that the result would not be binding in any way upon the city, but that it could be waived and the city proceed with the condemnation of the property of the old Renton line without prejudice.



Map Showing Existing and Proposed Municipal Railway in Seattle

In the meantime condemnation suits had been begun by the corporation counsel. On Feb. 18 Judge Mitchell Gilliam, in the Superior Court, after hearing the arguments of the city and counsel for the Renton line, made an order that the city could legally proceed to condemn the property, and on April 1 it was ordered to be sold. The sale is to be conducted by the receivers appointed by the State court. Counsel for the Renton line have applied for a writ of certiorari from the Supreme Court, and arguments will be heard in the higher tribunal on May 11.

SALE OF BONDS FOR CONSTRUCTION OF MUNICIPAL RAILWAY

The Council had advertised the municipal railway bonds for sale in the local newspapers and in recognized Eastern financial journals, but no bids were ever accepted. L. N. Rosenbaum, a local attorney, some months ago sub-

mitted a bid, but it was rejected because it was accompanied by no certified check as provided by law. A bid of $274,000 for the first $300,000 was rejected because the premium asked was too large. The matter of the sale of the bonds was then allowed to rest for about six months. Subsequently the City Council passed an ordinance transferring $300,000 from the sewer fund to be expended in the construction and maintenance of the municipal railway from Third Avenue and Stewart Street northward to the terminus, and on July 10, 1912, the Jahn Construction Company, which held a contract for $148,927.20, began work. Construction has proceeded so rapidly that the line is expected to be ready for the first four of the cars, which are due May 1.

FINAL SALE OF MUNICIPAL BONDS

The State of Washington is empowered by an old act to invest state school funds in any utility or bond issue of state, municipal, school or county purpose. Acting under this statute, on April 27 of this year Edward Meath, representing the state finance committee, after a conference with City Comptroller Harry Carroll, bought the $300,000 of the municipal railway bonds at par, with 4½ per cent interest, the interest to begin May 1, 1913. Mr. Meath intimated that the State was prepared to take the remaining $500,000 of the city railway bonds when the Council decided to offer them for sale. The two previous faulty bids, which were rejected, contained offers at 92 cents. By borrowing the money already expended on the line from the sewer fund the city has saved interest for nearly a year. The state finance committee is composed of Mr. Meath, Governor Ernest Lister and State Auditor Charles W. Claussen.

EQUIPMENT OF LINE

The section of municipal railway now constructed is laid with 60-lb. T-rail in the unpaved territory and 105-lb. Trilby section in the paved sections. The overhead construction has not yet been installed, but will be a complete metallic system with two trolley wires and adjustable trolleys to fit the single trolley wire system of the Renton line if necessary.

Twelve cars have been ordered from the Cincinnati Car Company, to be delivered at the rate of four cars per month from May 1 to July 1 this year. The cars will be dark green in color, with the lettering "Municipal Street Railway" throughout. It is officially announced that the car equipment is to be the most modern possible.

Bids for furnishing the cars were opened by the Board of Public Works on Dec. 13, 1912. The specifications called for twelve semi-steel cars equipped with maximum traction trucks. A. L. Valentine, superintendent of public utilities and ex-officio general superintendent of the municipal railway, in his annual report just issued, refers briefly to the proposed line, touching only upon the date of its commencement, its general construction and the pending condemnation suits and making recommendations regarding salaries of employees of the new line. His only comment is as follows:

"That excellent results will be attained in the conduct of the municipal street railway is to be expected, for construction costs will be low, a splendid revenue-producing territory is to be served and power can be secured at reasonable rates from our municipal lighting plant, the efficiency and utility of which will be increased by the street railway power load. Owing to our extended experience in regulating the operations of the present street railway companies, operating costs on the municipal street railway will be minimized to the lowest possible point consistent with the class of service the people expect and will receive."

PROPOSED AGREEMENT WITH RENTON LINE

Under proposition A, as ratified at the polls, the basis of the city's agreement as to profit sharing with the Renton line is as follows:

Annual settlement is required. From the gross receipts of the line and property from all sources there shall be deducted all expenses of operation, maintenance, repairs and renewals, all amounts contributed during the year and held in reserve, all taxes and assessments, including capital stock or franchise taxes (excepting such as are ordered by court), and all salaries and expenses of the board of supervising engineers. After deductions as named from the gross receipts the amount remaining shall be considered as the net receipts, 50 per cent of which are to be paid to the city.

The governing board is to consist of one engineer, appointed by the company, the superintendent of public utilities and an officer of the engineering corps of the United States Army with at least the rank of major, to be appointed by the company's and the city's representative. The Renton company is to execute a bond to preserve the city harmless as to its share of earnings, damages, judgments and decrees.

The transfer privileges and fares in the city limits are to be as follows: A 5-cent fare is to be good for a continuous ride on the Renton line or any of its branches hereafter to be constructed, and transfers shall be issued to all intersecting or contiguous lines. Four-cent tickets shall be good for one continuous ride on the Renton line and shall entitle passengers to an exchange of transfers with the city car line at the north terminus of the company's line at Stewart Street, so that there may be a continuous ride for a 4-cent fare over the Renton and municipal line. In case of dispute the passenger is to be permitted to enjoy the ride pending settlement.

No provision is made regarding the power of the Renton line in the event that the city takes the line over, as this company secures its power by rental. The city has ample power from its own municipal plant.

EVENTS PRIOR TO VOTE ON MUNICIPAL LINE

The events that led up to the passage of the ordinance authorizing a municipal line radiated largely about the protests of the people of the Rainier Valley, served by the principal trunk line of the Renton company, against the service as furnished formerly by the Seattle, Renton & Southern Railway, and dates back six years or more. The company refused to grant transfers to the lines of the Puget Sound Traction, Light & Power Company except on the mileage basis. The latter company declined to issue transfers to the Renton line except on the even split of the 5-cent fare.

At Kenyon Street the Renton line had been exacting a second fare to and from the southern city limits. This compelled residents of Rainier Beach and other well-settled suburbs to pay a 10-cent fare into the business section. The company also declined to stop the cars labeled "express" for local stops north of Kenyon Street outbound. Improvement clubs and mass meetings in the Rainier Valley protested against this system, the 10-cent fare dominating the cause, and committees waited upon the City Council to demand relief. The case went into court. Pending the decision, the Renton line was directed to issue receipts for the double fare, and if the company lost its suit the fares were to be remitted on presentation of these receipts.

Mayor H. C. Gill espoused the cause of the Rainier Valley people. Before a committee of fifty in the City Council chamber, while favoring a municipal railway system, he declared in an impassioned speech that if the Council did not order the tracks of the Renton line torn up, he would secure a gang of men and do it himself within a week.

Court proceedings were slow. The aid of the federal, superior and supreme courts was invoked by the Renton line, President Crawford, himself an attorney of record, directing the fight from his offices in the Alaska Building.

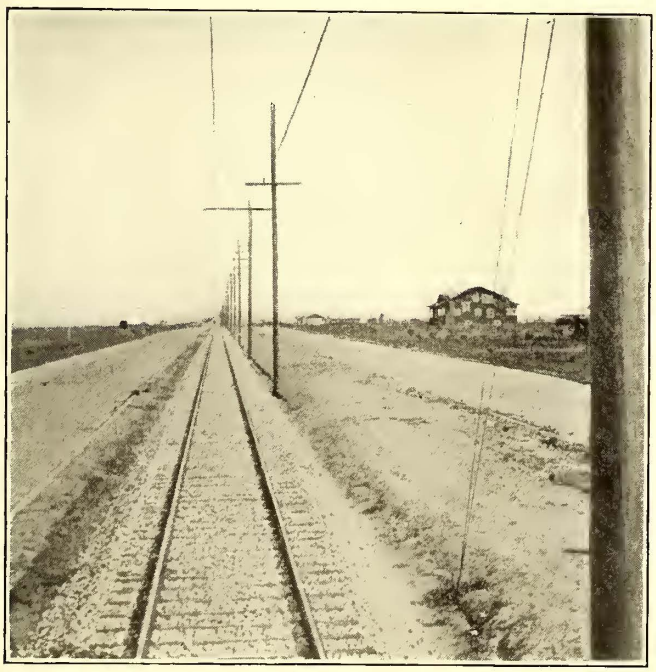
Committees from the Rainier Valley attended every "special order" meeting relative to the Rainier Valley troubles, and the result was the introduction and passage of the ordinance authorizing a municipal car line, which originally had for its object taking over the Crawford line.

CATENARY CONSTRUCTION OF THE PACIFIC ELECTRIC RAILWAY

During the past year and a half the Pacific Electric Railway, of Los Angeles, has installed about 51 miles of catenary overhead construction, on about 40 miles of route, and it is planning to make this class of construction its standard in the future, certainly for interurban lines.

The heavy service conducted by the company makes a straight running, working conductor, such as is furnished by a catenary overhead construction, extremely desirable, as will be seen from the statement that the trains of three or more cars, each car weighing over 80,000 lb., are often run at speeds in the interurban stretches of 60 m.p.h. or more and long freight trains are operated by 60-ton locomotives. The amperage which is collected from the wire at high speeds is consequently very large, and it would probably have been impossible to have collected the requisite amount of current from the overhead system if the company had not for a long time been using a trolley with a pneumatic base. By this means a pressure is put upon the wire at the wheel of about 30 lb. The problems of overhead collection have thus been greatly reduced, but it is believed that with the catenary construction still further improvement is possible.

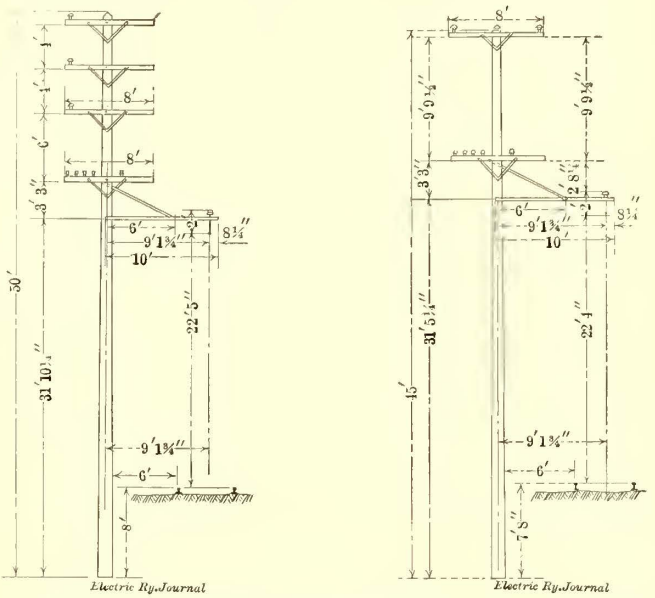
The accompanying two engravings illustrate the standard pole and bracket construction used in the latest catenary work of the company. One of these shows a pole designed to carry also a single transmission line; the other, a double transmission line. In the former case the three wires are carried in the same horizontal plane, an arrangement which differs from the usual triangular plan but is considered by the company better where the length of transmission is not too great so that there will not be any serious unbalancing effect from induction. The three transmission wires are carried on a single cross-arm so that they are easily accessible to the linemen. In the second arrangement the



Pacific Electric Railway—Interurban Track and Pole Line

three transmission wires are in a vertical position, and as the cross-arms are 8 ft. in length this arrangement also permits easy access to the wires by the linemen. In tangent catenary construction the poles are spaced 150 ft. apart, this distance being shortened on curves to 60 ft., even for a 1 deg. curve. The transition from 150 ft. to 60 ft. is made gradually.

A variety of types of hangers and insulators has been used in the catenary construction already installed, including the Southern Pacific type of hanger with round loop at the top and the commercial type of strap hanger with an extended flap loop. The hangers are spaced 15 ft. apart. The company has found it necessary to use tie spans to the trolley wire at occasional intervals on tangents to



Pacific Electric Railway—Standard Types of Pole Framing

hold the trolley wire in position. At present these spans are being used about every 300 ft. Otherwise the wire would cant, especially under heavy side wind pressure and when pressed up by the trolley pole. The company is constructing all of its catenary line for 1200 volts, because it has planned to change gradually to this high voltage on the interurban sections. It is also planning gradually to change from the ordinary overhead construction to the catenary construction, and probably within the next year and a half 72 miles in addition to that now constructed will be built.

POLE PRESERVATION

In all of its overhead construction the company treats the bases of its poles to prevent decay, the treatment being applied to the portion of the pole under the ground and for a distance of 1 ft. or 2 ft. above the ground. This corresponds to about one-seventh of the length of the pole. The process consists of charring the butts or portion treated over a fire made of shavings, and while the charred wood is still hot, pouring crude hot oil over it. In this way charcoal forms readily, and good penetration for the preservative material is secured. This process is applied in the pole yards and costs about 50 cents per pole for material and labor. The oil used is the ordinary crude oil, which costs in Los Angeles about 75 cents a barrel. After the pole is erected it is painted, and as the company is particular as to the character of the poles used, a catenary line on the Pacific Electric Railway, with its straight painted poles, is an attractive sight. The accompanying illustration shows a section of track of this kind recently completed on the Van Nuys line.

The recent order of the Berlin Hoch und Untergrundbahn Gesellschaft (Elevated & Subway Company) abolishing smoking cars has been abrogated by the police of that city. The original order was made partly on account of the fire danger from smoking and partly to minimize the confusion of passengers in reaching the desired compartment. Under the new rule, the trains will be made up in such a manner that the smoking compartment will be at either the front or rear end according to the direction of running.

RESISTORS FOR STREET RAILWAY SERVICE

BY F. W. HARRIS

The calculation of the necessary resistance and amount of resistance material in connection with ordinary street railway service is based on the hourly rating of the motors

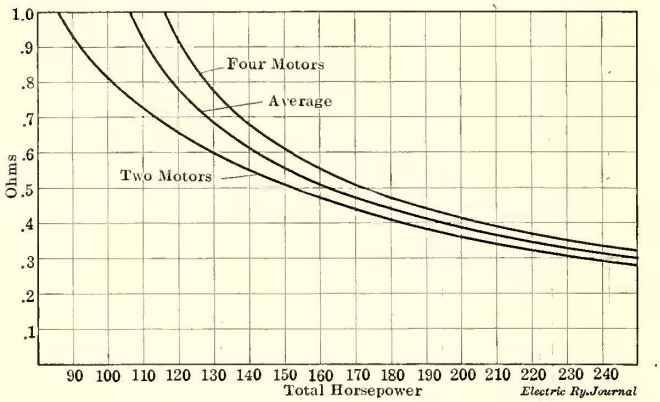


Fig. 1—Resistor Design—Method of Determining Average Motor Resistance

in horse-power. It is generally assumed that an amount of resistance should be used that will allow the hourly rating current to flow in the motors on the first notch of the controllers. A method of arriving at this value is given in the following paragraphs.

The first factor to be considered is the resistance of the motors themselves. This may be assumed as the average hot resistance of any line of motors, as the values for all motors now on the market are sufficiently near for the purpose. A close degree of accuracy is not necessary for this work. There are in general use both two-motor and four-motor equipments which cover a wide range of horse-power. Hence it is desirable so to calculate the resistance that it will be available for either two-motor or four-motor equipments. Fig. 1 gives the curves for these combinations, and from these is derived an intermediate curve shown as the average or mean curve. This curve is also an approximation, but it is close enough for the purpose.

The hourly current rating will flow in case the resistance equals 278 divided by the horse-power on the hourly rating basis. The hot resistor resistance is given by plotting the mean motor curve from Fig. 1 and subtracting the values of the mean motor resistance from the total resistance. For cast-iron grids an average increase of 10 per cent in resistance value when hot may be expected, and deducting this gives the value of the cold resistance. This represents the total resistance of the resistor, cold, on the first point of the controller.

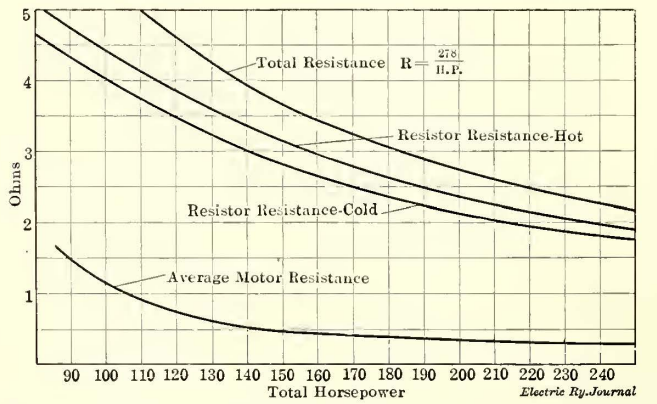


Fig. 2—Resistor Design—Method of Determining Required Grid Resistance

The number of grids will vary directly as the horse-power and will be different with different designs of grid. In standard grids now used by the large manufacturers of railway equipment it is often figured that about 4 hp per grid may be allowed for light service and about 3 hp per grid for heavy service. This practice varies with different manufacturers but is about as given in all applications. In Fig. 3 are plotted the total resistance and the number of grids, these representing average conditions as found in practice.

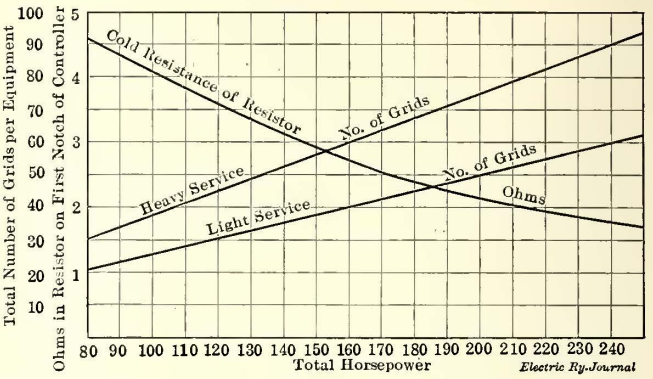


Fig. 3—Resistor Design—Number of Grids Required for Different Services

The proportioning of the various steps has been the subject of some deep investigation, but it becomes comparatively simple in practice. Since the object desired is to accelerate the car smoothly, the motorman is really the controlling factor, because the character of acceleration depends on the time interval. In fact, the men soon learn to manipulate almost any combination within reason. It is desirable to figure that the motorman will pass over the resistance notches in equal time intervals, but a small variation will not be noticed.

The most practical method for planning this is to make a curve as in Fig. 4. Here the percentages of resistance in circuit at any time are laid out vertically and the number of steps horizontally. In this instance ten controller steps are assumed.

The straight inclined line shown in the figure is a guide to the eye in drawing the curve, which may be done in about the proportion shown. This represents the resistance in circuit on any notch of the controller, the actual steps being found by subtraction.

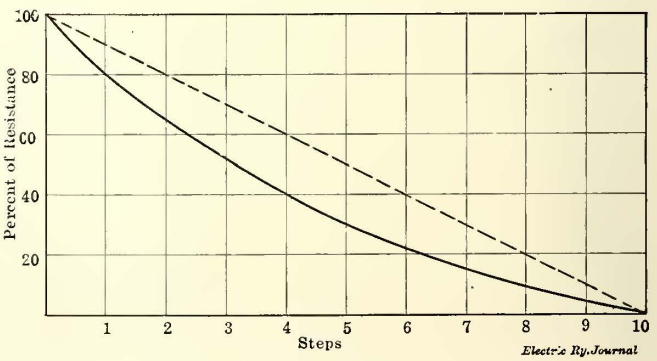


Fig. 4—Resistor Design—Proportions for Different Steps on Controller

In practice it will be found difficult to get the terminals conveniently placed if too much attention is paid to getting exact resistance values, and also that it is not advisable to be too particular about these values, because a wide variation from the calculated values, even 15 per cent, is rarely noticeable in the performance of the car under ordinary conditions.

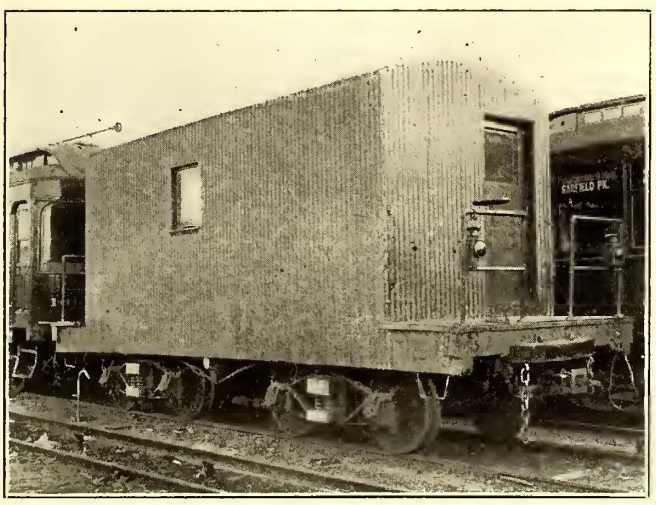
CHICAGO ELEVATED RAILWAYS FIRE ENGINE CAR

Eight chemical fire engine cars are kept in constant readiness to serve in case of fire on the elevated lines in Chicago. These cars are stored in the company's yards either on a separate stub track or first out on a storage yard track. They are always coupled to a motor car in perfect running condition with the air compressor in operation, so that there will be no delay while a sufficient rise in the air reservoir is obtained. These fire engines are for service not only to protect the railway company's rolling stock but also the elevated structure in case of fire in adjacent buildings. A crew properly organized and drilled is assigned to each fire engine car and on the sounding of a fire alarm takes charge of the fire-fighting apparatus. In addition to this equipment, elevator tanks, high-pressure fire pumps and a complete system of water mains and fire hydrants have been installed in all shops and yards, and a regular, organized crew has charge of this source of fire protection.

The general dimensions of the fire engine car are 27 ft. 4 in. over-all length and 8 ft. 5 in. width. The body, exclusive of the platforms, is 19 ft. in length and 8 ft. 6 in. in over-all height. The car is framed entirely of wood except for ⅜-in. x 1¼-in. iron carlines supporting an elliptical roof. The 24-gage corrugated-iron roofing and siding is applied outside of ½-in. poplar sheathing. The body is lined with ½-in. poplar, and a double floor of ⅞-in. pine interlaid with building paper is provided, which makes the car sufficiently weatherproof to prevent the solutions from freezing at low temperatures when the electric heaters are in service. Wire glass was included in the two doors and windows to reduce breakage which might be expected in the rush during a fire. Since the car is operated as a trailer it requires no other electrical equipment than the lighting and heating circuits, and these are supplied with electrical energy through standard third-rail shoes. Hand brakes with the brake wheel located on the platform were provided for use in emergency, and a thorough train line connection from the motor car provides automatic air brakes.

FIRE-FIGHTING EQUIPMENT

The fire-fighting equipment includes a 280-gal. reservoir, two chemical tanks of 100-gal. capacity each, 300 ft. of hose, three extra standard charges, two 6-gal. hand extinguishers,



Fire Engine Car—General View, Showing Corrugated Iron Sheathing

two 12-ft. regular pike poles, two 7-lb. fire axes, wrenches for unscrewing the cover of the chemical tanks and two lanterns kept lighted and ready for service at all times. The 280-gal. reservoir is elevated above the car floor level to give sufficient hydraulic head to fill the two chemical tanks quickly. The support for the tank is utilized as a locker, which contains additional soda packs and extra charges of acid. The reserve tank is made of No. 12 sheet steel and provided with an outlet to the chemical tanks through a 2½-in. quick-opening valve. The pipe connecting the reservoir to the chemical tanks is carried down under the car floor so as to provide free access to the engines. The reserve tank which contains the water supply is filled by a hose through a 2-in. opening at the top. This opening is formed by a 2-in. pipe extending down 3 in. into the tank, which

Fire Engine Car—Interior View, Showing Hose Racks and Tanks

prevents the water from splashing out when the car is in transit. A gage glass on the side of the tank near the top records the water level inside, thus preventing overflow when it is being refilled, and indicates to the fire inspector that the reserve tank is filled with water at all times.

The 100-gal. chemical tanks are installed in one end of the car body so as to balance the load on either side of the body center line when all tanks are filled. These chemical tanks are made of homogeneous steel and designed for any possible pressure generated by the chemicals. Each tank is mounted on a trunnion passing through the center longitudinally and supported on bearings at each end, thus allowing the tank to be rotated, which action discharges the acid, making the solution ready for service. These trunnions are formed of pipes, one of which serves as the outlet. A manhole in each tank permits the acid charge to be placed within ready for instant service. After the soda charge is dumped in the tank it is partially filled with water and a standard charge of acid is placed in position before the manhole cover is replaced. So as to assure a thorough mixing of the chemicals when the engine is ready for service a shaft passes through the axis of the tank. Paddles provided on this shaft and a crank at one end permit the operator to agitate the mixture thoroughly after the acid charge has been opened.

Two wire-mesh baskets supported on racks over the chemical tanks provide space for storing 300 ft. of hose. This hose is 1 in. in size and cut in two sections of 150 ft. each. Each section is provided with a combination nozzle and valve, and is of special quality to withstand the action of the chemicals.

PERFORMANCE TESTS

An actual service test made with one of these fire engines recently demonstrated that but a few seconds was required to secure a pressure of 150 lb. in the tank after the discharge of the acid into the soda solution. At this pressure the nozzles will throw a stream 75 ft. in length, and a greater range may be had at greater pressures. Each tank will discharge at an initial pressure of 150 lb. for three minutes, and it requires two and a half minutes to refill and recharge an empty tank. This rate of discharge permits one tank to be charged while the other is discharging, the

total time for which the engine is available for fire service being fifteen minutes. In case an outside source of water supply is available this time may be extended.

FIRE DRILLS

The primary purpose of these engines is to extinguish small fires and to keep large ones from spreading until the city fire department arrives on the ground. In order to insure the ready-to-serve feature of this equipment a permanent chemical fire engine organization is maintained at each point where a fire engine car is stored. These organizations are composed of at least four employees from the shop and transportation department. All shops and storage yards are provided with large fire bells installed so that they may be rung by anyone seeing a fire. At the sound of an alarm the men composing the engine organization drop their work and run to the fire car, the location of which has been noted in advance. Each man is assigned to special duties, with which he is familiarized by frequent drills. In case the fire crew is not expert these drills may take place once or twice a day, but when the men become expert a fire drill once a week is sufficient. A fire chief is appointed with each organization, and in case of his absence an assistant serves.

As soon as the man whose duties include charging the chemical tank boards the car he rotates one of the tanks, thus allowing pressure to accumulate until the fire is reached and the hose is brought into play. The hose is arranged in the wire basket with the nozzle resting on the side so that it may be picked up readily and run out through either one of the end doors. Two extra charges of acid are set on the car floor near the tanks so that they are available for instant use.

As mentioned before, the fire car is so stored on a separate track that it is unnecessary for the company to move other equipment to put it in service. The motor car, which is always coupled to it, is set so that the third-rail or trolley is in contact and the air compressor in service. Three of these equipments are stored in the shops and yards of the South Side Elevated Railroad, one on the Northwestern Elevated Railroad Company's lines, one on the Chicago & Oak Park Elevated Railroad and three on the lines of the Metropolitan & West Side Elevated Railway. Although they have not been required for fire service a great many times, their efficiency has been demonstrated and they have served to reduce insurance rates on rolling stock and the elevated structure.

The fire engine cars, an interior and an exterior view of which are shown in the illustrations, were designed and built by the mechanical departments of each road under the general supervision of H. A. Johnson, master mechanic. The total number of fire cars has been added to from time to time, but the general character of the fire engine equipment has obtained in all with but minor changes in the detailed design.

NEW GERMAN INTERURBAN RAILWAY

The Allgemeine Elektricitäts Gesellschaft has obtained a franchise for the construction and operation of a freight and passenger electric railway from Merserburg to Müchlen, Germany, a distance of 11 miles. The line will be of meter gage (39.37 in.), and a fifteen-minute service at a schedule speed of 12.5 m.p.h. will be given over a single track. Energy in the form of 6000-volt, three-phase current will be purchased from a power station located near a coal mine at an initial price of 1.1 cent per kw-hr. with a possible minimum of 0.9 cent per kw-hr. At two substations this current will be converted to 550 volts d.c. The district served by the line, including the terminal towns, has a population of about 40,000. The construction of a cross-country road of this character is looked upon in Germany as an interesting experiment in the development of narrow-gage (secondary) electric lines in coal-mining territory.

EXPERIENCES WITH RECENT FLOODS

The Evansville Railways had about 4 miles of the Rockport division under water during the extraordinary flood which extended over practically the entire State of Indiana four weeks ago with generally disastrous results. No damage was done to the track or grade, as this was back water and the only loss resulted from the inability to give service. The lines were out of service ten days. There was no damage to the power house or rolling stock. The Mount Vernon district was not interfered with at all on account of high water, either from head water or back water.

The Henderson division, which uses the Illinois Central Railroad tracks between Evansville and Henderson, was out of service because about 2 miles of the tracks of that company on the Indiana side of the river were washed off the grade. This was the only damage and no injury was done to the fill, as this is well rip-rapped. The line was out of service about two weeks.

There was no damage to any of the city tracks in Henderson, Ky., or Owensboro, Ky.

The Evansville, Suburban & Newburgh Railway was one of the fortunate lines and did not suspend operation of cars. While the tracks are located upon the levee of the Ohio River at Newburgh, the company was able to keep the water in check by the liberal use of sandbags and hard work and did not sustain any great losses.

FLOODS AT MEMPHIS

Some inconvenience has been experienced from the flood in Memphis. The city proper is from 70 ft. to 150 ft. above the extreme high-water mark of the Mississippi River, but a small bayou running through a portion of the city empties into the Mississippi River and a district of limited area near the mouth of this bayou overflows in very high water. On some streets the Memphis Street Railway was obliged to operate on temporary tracks. In other cases plank walks were built, and the street railway passengers walked across the flooded districts. This condition lasted about ten days. The water is now receding, and the difficulty has passed.

DAMAGE AT LITTLE ROCK FROM FLOOD

On April 9 there was a rainfall in the vicinity of Little Rock, Ark., of 9.58 in. in eighteen hours. All of the creeks immediately became raging torrents and bridges were washed out of the public roads throughout the counties, Pulaski and Saline Counties being the most affected. Approximately $100,000 damage was done to the county roads.

The Little Rock Electric & Railway Company suffered some loss. The natural-gas main which furnishes the city of Little Rock with natural gas from the Caddo fields in Louisiana was broken where it crosses a creek in Saline County and gas was cut off from the entire city without a moment's notice. The railway and electric company was using natural gas for fuel at its power house, but happened to have two boilers equipped for burning coal at the time the break occurred. The company also has an auxiliary fuel supply of crude oil, but the gas was discontinued so suddenly that there was not time to light the oil under the boilers that were equipped for burning gas; therefore the company was forced to shut down the railway load for twenty minutes. The lighting load was carried by the two boilers that were being fired with coal.

On one of the suburban lines, which runs to the town of Pulaski Heights, the company had two or three small washouts which delayed traffic for two hours on this line until temporary repairs could be made and the track made safe for operation. Other than this there was no damage.

The steam roads, however, in the territory about Little Rock suffered a great loss, due to the abandonment of all trains into the city from every direction with the sole exception of the Cotton Belt Railroad, which had no washouts.

Papers at the Iowa Convention

Abstracts Are Published of Two Papers Presented at the Waterloo Convention of the Iowa Electric Railway Association This Week—One Discusses Methods for Preventing Accidents on City and Interurban Railways—The Other Relates to Methods for Reducing Generating Costs

MODERN METHODS OF REDUCING GENERATING COSTS

BY D. W. GILBERT, SUPERINTENDENT OF POWER STATIONS OMAHA & COUNCIL BLUFFS STREET RAILWAY

An investigation looking toward the reduction of the cost of power must begin by a study of the territory in which the proposed plant is to be placed and the work expected of it. The availability of fuel, water and other supplies, labor conditions, the nature of the grounds, transportation facilities, atmospheric conditions and permanency expected, all have a definite bearing on the methods to be used and the choice of apparatus.

To attain the greatest economy from a station entails the careful investigation of every piece of apparatus and every step connecting it in its proper relation to the others and giving due consideration to the cost of investment, depreciation and cost of repairs.

It is a matter of the greatest importance that provision be made at every step so that the operating force in the power station may know just what is taking place at all times in order to keep the apparatus in its best possible working order. Provision should be made so that the ash and the coal may be properly weighed. Wattmeters should be installed on the outgoing lines and also on each prime mover. Indicating instruments should be placed at all motors used on auxiliaries throughout the station and water meters should be provided on each prime mover if possible. If this is not possible, the piping to the water meter or meters should be so arranged that each unit can be tested at any time. There should also be a water meter on the make-up water for the station. Recording temperature gages should be placed on the inlet and outlet of the economizers and in the main flue leading to the chimney. The inlet and outlet temperatures of the circulating water through the condenser should be recorded. The temperature of the condensate from the condenser should be recorded in the same way. The main steam pressure and temperature of feed water from the heater should also furnish their recorded evidence. Recording electrical instruments such as voltmeters and ammeters should be placed on all the principal machines so that all fluctuations can be immediately noted. These instruments should be liberally supplied throughout the station so as to enable the engineer to refer to them as a current means for checking the operation of his plant, and the records should be carefully filed so that they may be referred to at times in the future where their evidence may be of very great value.

The importance of securing and maintaining an efficient operating force cannot be overestimated. For with the best equipment it is possible to obtain high operating costs will be the rule rather than the exception with inefficient operators. With an efficient and harmonious operating force surprising results are often obtained, even with what is not considered the last word in up-to-date equipment.

Among the points which may be readily determined by the use of the proper measuring instruments are whether the condenser is becoming dirty, thus avoiding a possible interruption of service, and whether the condenser is leaking, a very important item, especially where the circulating water is unfit for boiler-feed water, as the overlooking of this one thing for any length of time is liable to cause very expensive boiler cleaning and repair bills, which would amount to many times the cost of a water-weighing device.

It is also possible to determine whether the turbine blading is becoming dirty, as is sometimes the case where certain kinds of water are used for steam purposes, and if the prime mover is a reciprocating engine, leaking pistons may be discovered. It is often possible to save in operating cost as well as to avoid a possible repair bill and an interruption of service by thus keeping in daily touch with each piece of apparatus in operation.

Where coal is used for fuel it is very important that a regular analysis be made and a record be kept, so that the coal consumption for different months can be compared. This can be done by taking a small amount from each car unloaded during the month, quartering it down, making one sample, and having it tested by some responsible party. But where the plant is of sufficient size to warrant the expense it is much better to install instruments in the plant, so that an analysis can be made for each car of coal unloaded. The data thus obtained, together with the aid of a simple and inexpensive instrument for measuring the percentage of CO_2 in the gases of combustion, will be of great help in the boiler room.

A recording draft gage should be installed at the stack, or if induced draft be used, the gage should be placed on the suction side of the draft fans. Where it is not deemed advisable to install draft gages for each boiler a portable draft gage can be used with very good results. In addition to these instruments it is advisable to have a standard thermometer that can be used for taking the temperature of the uptake gases.

Another item of cost which should receive serious consideration is that of cleaning boilers, especially in a large station with water-tube boilers. It has been found, even in a station where surface condensers are used, that it is possible to make a very decided saving in the cost of cleaning boilers by using in connection with a mechanical cleaner some good feed-water treatment.

Another item very often lost sight of in turbine stations of this district where the temperature of circulating water used in surface condensers is very low for several months in the year is the temperature of the condensate as compared to the temperature which it should have with the vacuum carried.

To cite a concrete illustration of this point it was found in one plant by making a test that the temperature of the condensate leaving the turbine condenser was only 37 deg. Fahr. with a circulating-water inlet temperature of 34 deg. Fahr. and a vacuum of 28.52 in. referred to a 30-in. barometer. It should have been about 81 deg. Fahr., and with condenser equipment of the latest type this temperature could be raised to about 88 deg. Fahr., thus making a difference of about 51 b.t.u. for every pound of condensate returned to the hot-well. This reduced to dollars and cents represents a 6 per cent return on an investment of $47,000 based on a 4000-kw unit running twenty hours per day, with 10,500 b.t.u. coal costing $2.50 per ton.

In passing it may be well to call attention to a very important, if not the most important, point in connection with the successful and economical operation of even the most modern power station, and that is the point of keeping the repairs of the station "up to the minute." The motto of "Do it now" can very successfully be applied to the power station. While economy should always be the watchword, the fact must never be lost sight of in public service plants that continuous operation must always receive first consideration, even at the expense of economy.

SUCCESSFUL METHODS OF PREVENTING ACCIDENTS

BY ARTHUR G. RIPPEY, CLAIM ATTORNEY DES MOINES CITY RAILWAY AND INTER-URBAN RAILWAY, DES MOINES, IA.

No more vital problem confronts the electric street and interurban railway companies of this country to-day than that of accidents. As cities grow and populations increase it becomes more and more difficult to operate electric railway systems without proportionate increases in the number of accidents. It is becoming harder all the time successfully to defend actions for personal injuries and damages to property. This is true for several reasons.

One is that many jurors seem to be impressed with the idea that a plaintiff should have a verdict in these cases simply because the accident happened, regardless of whether there was any negligence on the part of the company through its employees or whether there was careless or negligent conduct of the person injured or whose property had been damaged. Another is that the courts of our country are becoming progressive, and there is a greater tendency, as time goes by, to submit all questions involving negligence to the determination of a jury. The so-called humanitarian, or last fair chance, doctrine has been invoked in a successful effort to get away from the doctrine of contributory negligence.

Another is that state legislatures have adopted laws changing the law relating to contributory negligence and assumption of the risk, especially where the relation of master and servant exists. Indeed, the present Legislature of Iowa has passed an employers' liability and workingmen's compensation bill the effect of which is to compel the payment of certain sums of money, according to certain injuries sustained by the servant while in the employment of the master, without reference to the question of negligence, unless it be that of wilful negligence on the part of the servant. If the company elects not to come under its operation, then, in case of injury and suit, the bill takes away from the master the defense of contributory negligence and assumption of risk and casts upon the master the burden of proof in the first instance that the accident was without fault on its part. The practical effect of this bill is to make the master an insurer of the safety of its employees and to compel payment for a servant's injuries, regardless of who is to blame for them.

Therefore the question of what to do with the accident problem is squarely before us. A fair average of the amount paid by electric railway companies on account of accidents in this country as a whole is said to be from 5 to 7 per cent of the gross earnings of the different companies. In view of this situation, there have been many suggestions as to methods of coping with it.

For the purpose of this paper the matter may be divided into two general classes:

(1) The proper training of motormen and conductors together with the proper equipment and inspection of cars

(2) The education of the great American public.

THE PROPER TRAINING OF MOTORMEN AND CONDUCTORS AND THE PROPER EQUIPMENT AND INSPECTION OF CARS

The first and fundamental thing is that the man who employs motormen and conductors shall be a keen judge of human nature, so that when motormen and conductors are secured, if properly trained, they will have such mental and physical ability as to become successful in the matter of properly operating their cars with the minimum number of accidents. The subject of employing men has been discussed quite fully by the American Electric Railway Claims Association and was admirably presented by E. T. Walsh, attorney for the United Railways of St. Louis, at the meeting of the association at Atlantic City in 1911. I quite agree with his conclusion that selection is really of as much importance as instruction.

After proper men have been secured they should receive thorough and painstaking instructions as to their various duties. In my judgment student motormen and conductors receive entirely too little preliminary instruction, rather than too much. In the first place, they should put in enough time in the car shops to become thoroughly familiar with the mechanism of the cars they propose to operate, particularly the construction, operation and use of the controllers, motors and air brakes. After passing through this stage of the matter they should be placed in charge of first-class motormen and conductors, or special teachers, for instruction in the actual operation of cars.

I am heartily in favor of designating a small number of conductors and motormen, who shall be carefully selected, to train and instruct students. Selection and instruction are of very great importance, because they determine the future of the various motormen or conductors and mark the difference between efficient employees, who have few if any accidents, and careless or indifferent employees, who have many accidents and cost the company large sums of money.

Having finished the course of preliminary preparation and before he starts out for regular or extra duty alone, each motorman and conductor should report to the claim department, where he should receive careful and minute instructions on various matters pertaining to accidents, such as making out full and detailed accident reports of facts and not inferences, securing names of witnesses, noting where and when bell was rung, speed of car, etc.

Regular meetings should be held for the instruction of trainmen as to the best methods of preventing accidents. All motormen and conductors should attend these meetings. The meetings should not be held spasmodically but regularly and should become a permanent institution. Lectures should be delivered by someone representing both the claim and operating departments. Part of each meeting should be devoted to discussion by the men themselves. In this way interest will be sustained.

There are many matters which may be taken up at the regular instruction meetings and aid in the prevention of accidents. Some of these I have personally tried and know are efficacious.

For instance, several years ago, when I first took charge of the claim departments of the Des Moines City and Interurban Railway companies I found we were having an unusual number of serious and fatal accidents, caused by persons alighting from cars, going directly behind them and colliding with cars coming from the opposite direction on the other track. I immediately brought this matter up in our meetings and urged the great importance of two things as a preventive. One was to ring the bell continuously as a moving car approached a standing car. The second was to reduce the speed of the moving car and get it under absolute control, so that the motorman could stop instantly if anyone came from behind the other car. I kept at this matter in season and out of season for more than a year, and the result has been that this class of accidents has been almost entirely eliminated.

After an accident happens the conductor or motorman should report to the claim department, where it may be discussed and means pointed out whereby its repetition may be avoided.

Training a motorman or a conductor to anticipate danger is a preventive measure that cannot be safely ignored. I have found that we have men who have operated cars on our lines for years and have never had a serious accident and have never cost the company a dollar in court or out of court. This seemed strange to me, and I began to study these men, with the result that I found they were constantly anticipating or foreseeing danger and dangerous situations. Consequently, they were avoiding accidents. They are what I call, for want of a better term, "accident anticipators."

For instance, I discovered that certain motormen studied and knew the rail conditions and operated their cars accordingly. If they saw a closed vehicle, such as a covered milk or laundry wagon traveling in the same direction as their cars, they reasoned that there was danger, because the driver might pull onto the track in front of the car at any time without looking; so, instead of running rapidly up to and by the vehicle, they reduced the speed of their cars to such an extent that if the careless driver turned onto the track or toward it as the cars approached or passed they could stop their cars and avoid the accident.

Again, when these men saw small children playing in the streets or on the parkings, they reduced the speed of their cars and rang their bells vigorously, so that if any heedless boy or girl ran toward the tracks the cars could be stopped and an accident prevented. They took into consideration the thoughtlessness of childhood. And so the illustrations might be multiplied indefinitely.

I therefore lay particular stress in my lectures to the men on the plan of developing the power to anticipate and avoid dangerous situations and consequently the accident itself. The result has been entirely worth while. Criticism may be made that trainmen may spend so much time anticipating dangerous situations as seriously to delay their cars. The fact is, however, from our experience, that these men make their time and are almost invariably on their schedules.

I assume every street railway company has a rule requiring gongs to be rung on approaching street intersections. Many cities have ordinances requiring it. As an accident preventer intelligent gong ringing has no equal. These rules should be rigidly enforced. My observation has been that most motormen obey the rule, but many of them content themselves with a tap or two, instead of a steady continuous ringing as they approach the danger zone. Do not neglect this important matter. Haven't you ever sat in court and been robbed, the larceny being perpetrated under the guise of testimony of people on the car or near the accident who were positive the bell was not rung because they did not hear it? It is a regular yeggman's trick and the favorite refuge of the personal injury lawyer. The remedy is to compel motormen to ring gongs loudly and insistently when they approach and enter danger zones. And beyond all shadow of doubt a street intersection is a danger zone.

Where cars are used without gates or doors on the boarding and alighting platforms, it is a common practice for people to get on and off while the cars are in motion. We have had considerable trouble with this class of accidents. To meet one phase of it, particularly where women and children alighted before the car stopped, we insisted that conductors, instead of standing still and watching them, should move over and block their passage. This has proved by our experience to be an efficient method of preventing many people from alighting from moving cars. The result has been gratifying because a large number of our conductors have been trained now to block the exit until the car has completely stopped. This has not been accomplished without a great deal of persistent and painstaking effort.

Perhaps all electric railways have had accidents caused by people slipping on snow and ice which had accumulated on car steps and platforms. Five years ago we had a considerable number of such accidents. This class of accidents has been eliminated by compelling carhouse men to remove ice and snow from all steps and platforms before putting the cars into service and by installing brooms and ice scrapers on each car and seeing to it that the conductors keep the steps and platforms free from snow and ice.

Another preventive measure that, in my judgment, will eliminate a large number of head-end as well as boarding and alighting accidents is the adoption of the near-side stop for cars, especially in the congested portion of our large cities. It has two great advantages: (1) the saving of time by eliminating one stop, and (2) after the stop has been made, motormen have an opportunity to look both directions for approaching pedestrians and vehicles of all kinds. There can be little, if any, excuse for a collision at such points.

Boarding and alighting accidents have become so numerous with us on our city lines that we have been forced to do something to eliminate them, aside from carefully drilling our conductors in preventive methods. So about Jan. 1 of this year we equipped eight cars with doors in four sections which, when shut, completely close the rear entrance and exit. These doors divide in the middle, two sections opening toward the rear and two toward the front of the car. In connection with these doors we have disappearing steps, which lower when the doors are opened and fold up against the cars when the doors are closed. The mechanism is so arranged that conductors operate these doors and steps by turning levers which are located near where they stand in the car.

We put these cars on our heaviest lines where they have been constantly in service for approximately four months. The result has been astonishing, as we have not received a report of a single boarding or alighting accident in connection with these eight cars. We soon will have fifteen more cars in service with the same equipment. It is our intention to equip all city railway cars in the same manner. We apparently have found the solution of the vexing question of boarding and alighting accidents.

However, the adoption of the center-entrance type of car without steps may be the final solution of accidents of this character.

EQUIPMENT AND INSPECTION

All cars should be thoroughly equipped. The matter of inspection is of first importance. No car should be sent out without rigid inspection of steps, hand rails, platforms, and particularly of brakes, hand or air, and motors, and all defects should be immediately remedied. The reason is obvious. The law does not listen sympathetically to excuses regarding defective or inadequate equipment, and juries do not listen at all.

EDUCATION OF THE PUBLIC

That accidents may be prevented by educating the public has been demonstrated. One of the effective methods of doing this is by means of cards illustrating the various kinds of accidents which ordinarily happen. These cards should be placed in the street cars in such positions as to be readily seen by the passengers. We put one card in the front of each car and one in the rear so as to catch them coming and going. On these cards are printed certain warnings, such as "Never alight from or board a moving car," "Look both ways before crossing street car tracks," "Do not take hold of wires," and other good advice, with all of which this association is familiar.

We have adopted another method supplementing the card system in the cars for preventing accidents, and that is the distribution of a large number of blotters among the pupils of the public schools in Des Moines. On the back of the blotters are pictures that correspond to the pictures installed in the cars with appropriate warnings and reading matter. We secured enough of these blotters to supply each scholar with one a month, for a period of nine months, each blotter being different, with different pictures and reading matter. The reception given to this matter has been favorable. Just how many accidents it has prevented of course it is impossible to state, but we have reason to believe it is getting the young people and children started in the right direction, and having once acquired the safety habit, they will follow it through life.

In addition to the foregoing, we propose to deliver lectures before the school children at regular periods, illustrating them with appropriate pictures.

This matter of educating the school children has probably received more attention in the Far West than anywhere else. Mr. Boynton, general claim agent of the Portland Railway, Light & Power Company, Portland, Ore., is the pioneer in this line and seems to have accomplished a great deal. The Public Service Railway of New Jersey has also within recent months paid especial attention to this school work.

We are co-operating with the large teaming interests of our city to the end that the teamsters using the streets shall exercise greater care in avoiding accidents with street cars. It is my purpose to interest in this campaign of education the various automobile clubs and taxicab companies, as we have many automobile accidents in the city of Des Moines, practically all of them due to the careless driving of automobiles.

This paper has been written largely from the viewpoint of our experience in operating a street railway system in a city of about 100,000 people, where all cars are operated past a central point. We also operate about 75 miles of interurban railroad and have found that the accidents thereon are not nearly so numerous or troublesome as are those connected with our urban system.

ACCIDENTS ON INTERURBAN LINES

We follow the same general methods of prevention in dealing with our interurban accidents as we do with the street railway. There are, however, certain radical distinctions that must be borne in mind. For instance, interurbans are operated largely upon private rights-of-way in the country, while street railways in cities operate usually over the streets of the municipality. The courts have adopted somewhat different standards of care to be exercised by the trainmen. As illustrating this, the courts hold that an interurban car has the right-of-way over travelers at country crossings, while at crossings or street intersections in cities the rights of the street cars and other travelers are equal.

Again, in cities you are usually prohibited by ordinance from operating street cars at a greater rate of speed than a certain number of miles per hour, while in the country no rate of speed is negligent as a matter of law, although it may become a question of fact for a jury to say whether a car running at a given rate of speed is negligently operated. In Des Moines the speed limit prescribed by ordinance is 8 m.p.h. in the business districts and 12 m.p.h. in the residence districts.

Most of our interurban accidents are collisions with vehicles at crossings, derailments and head-end collisions between our own cars. We have really had comparatively few interurban accidents.

Many interurban roads have some blind or dangerous crossings where the view of both the traveler and motorman is obstructed. At such crossing we have carefully instructed our motormen not only always to give the statutory signals, but to do the obviously sensible thing, and that is to reduce the speed of their cars so that they can stop and avoid a collision if some careless driver comes suddenly onto the track ahead of their cars.

In cities and towns in Iowa the operation of interurban cars on streets is governed by the same laws as the operation of street cars. The Supreme Court of Iowa, in Swisher versus Inter-Urban Railway Company (130 N. W. Rep., page 404), has held that the bell and whistle statute compelling steam engines to be equipped with steam whistles and bells and requiring certain crossing signals applies to interurban railroads. Two justices of this court dissented, and the decision is squarely opposed to well-reasoned cases of the Supreme Courts of California and Louisiana.

To obey the law as laid down in the Swisher case you must require your interurban motorman while operating in the country to blow the whistle twice sharply 60 rods from the highway crossing and to ring the bell continuously from that point until the crossing is passed.

EJECTMENTS

Perhaps all companies, both street and interurban railways, have had trouble over ejectments. The law reports contain many cases arising over disputes as to transfers, failure to pay fare and ejection of drunken persons from cars. The Legislature of Iowa has taken cognizance of the situation in so far as it relates to intoxicated persons and the use of profane language and in 1909 passed a statute which, undoubtedly, gives more protection to the railroad companies in handling intoxicated people.

This statute is Chapter 141 of the Acts of the Thirty-third General Assembly and is as follows:

"Section 1. Misdemeanor.—Any person who shall drink intoxicating liquors as a beverage on any passenger railway car or street car in service or who shall use profane or indecent language on such railway or street car shall be guilty of a misdemeanor.

"Sec. 2. Powers of Conductor.—Any conductor of a railway train or street car carrying passengers shall have the right to refuse to permit any person not in the custody of an officer to enter any passenger car on his train or street car in his charge who shall be in a state of intoxication, and shall have the further right to eject from his train at any station or from his street car at any regular stop any person found in a state of intoxication, or drinking intoxicating liquors as a beverage, or using profane or indecent language, on any passenger car of his train or any street car under his charge, and for that purpose may call to his aid any employee of the railway or street car company."

Our experience has been that it is better not to eject a drunken person so long as he is not seriously annoying or disturbing other passengers. If it becomes necessary to make an ejection, our men are instructed to take the person to some place where he may receive some attention. I am opposed to putting a drunken man off the car on a cold or stormy night at a highway crossing, or at any point where he is liable to get back on the track or where he cannot secure shelter. Drunken men usually develop an intense desire to go to sleep on the railroad track.

BLOCK SIGNALS AND CONCLUSION

That many accidents may be avoided by the installation of proper signaling systems on interurban roads would seem to follow, judging the result by a table recently compiled by P. J. Simmen, based on the reports of the steam roads to the Interstate Commerce Commission. [For this table see Electric Railway Journal for March 22, 1913, page 551.—Eds.]

Some distinguished patriot has said: "Eternal vigilance is the price of liberty." Paraphrasing this language so that it may be a guide to the patriotic gentlemen who are ably presiding over the destinies of the electric street and interurban railways of this country, I beg to offer this: "Eternal vigilance is the price of safety."

PERCENTAGE OF 5-CENT FARES COLLECTED IN CLEVELAND

John J. Stanley, president of the Cleveland Railway, in his testimony at Detroit, Mich., during the suit against the 3-cent fare ordinance which was passed by the Detroit City Council, said that out of the total number of fares taken by the Cleveland Railway in 1911 1.33 per cent were 5-cent fares. This percentage was determined by taking all of the 5-cent and 10-cent pieces in the fare boxes as 5-cent fares, the pennies and tickets in the fare boxes being counted as constituting the 3-cent fares. Mr. Stanley explained that while a passenger might pay two fares with a 5-cent piece and a penny, the 5-cent piece would be counted as a 5-cent fare in this computation, because that was the only practical way of determining the results. Tests made on five different lines of the Cleveland Railway on different days for the purpose of checking the accuracy of this figure showed a percentage of 1.35.

TRAFFIC DELAYS—THEIR CAUSES AND REMEDIES

Through the courtesy of President W. A. Bancroft of the Boston Elevated Railway Company, a résumé is given below of an extended discussion of the causes and prevention of traffic delays, a topic handled at a meeting of the company's Efficiency Club.

CONDUCT OF EMPLOYEES

A primary cause of traffic delays is stubbornness and indifference on the part of transportation employees. An inefficient switchman will cause more congestion at points where two or three switches are to be operated than almost any other class of employees. Conductors and motormen who are indifferent about reaching junction points on time delay the schedule badly in many cases. When behind time they carry more than their quota of passengers, and when they reach junction points they cut off cars that should be from one to three minutes ahead of them. This tends to delay these other cars perhaps two or three times this amount of time in reaching the ends of their routes and adds to the expense of set-back movements. Many such cars start from points other than the carhouse and do not get set-back service, and after the first one or two trips they tend to become bunched in leaving route terminals. This condition continues until one or more trips are lost. The remedy seems to be to hold street inspectors responsible for the arrival of cars on schedule time at junction points, fitting them in so far as possible in proper order and keeping a closer watch of the service to ascertain whether the trouble lies with the manner in which cars are handled or whether additional service is required to meet the demands of heavy travel. Progress is retarded when those who object to orders for the improvement of service fail to complete their work until urged on to do so by additional orders. Causes of complaint from the public are often based on this condition. All suggestions from reliable persons should receive respectful consideration, and when orders are given for certain work to be done it should be started and completed within a reasonable time.

DERAILMENTS

A large percentage of derailments occur at switches and on curves, and a small percentage at low joints, wide and narrow gage. The cause of derailments at switches may be a loose tongue, tongue low at the point, or switch mate badly worn in one or both ways. The only remedy is frequent inspection by men having a knowledge of both tracks and trucks. On straight lines, where the gage is wide because heavy teams pull in and out of the track and break tie rods or nuts, the track inspector should pick out the places where the paving is low or worn and have it raised, so that when a heavy team pulls out the wheels will creep up on the rail and not grind against it. On curves where the gage is wide the gage should be regulated according to the wear. It is good practice to oil curves and switches at least twice every twenty-four hours. A more rigid inspection of run-off switches is also desirable in many cases. In order to reduce the percentage of derailments caused by trucks, the latter should be kept in good condition, with wheels carefully inspected and center bearings well oiled. Pit foremen should see that no bolts are left long enough to interfere with proper swiveling in rounding curves and that no tools are left on the tops of motors after repairs. Equipment inspectors as well as the division superintendent should make inspections after derailments.

UNDERPOWERED CARS

To prevent traffic delays by cars which are not in the best condition special consideration must be given to the capacity of the equipment. The use of old motors may easily disarrange the schedule, particularly when the traffic is heavy. Unless the type of truck is suited to the car design and schedule conditions, a car will lose a large amount of time through slow-downs, particularly when passing over poor rail and special-work sections. The only remedy appears to be to replace old equipment with more efficient and powerful motors and improved designs of trucks. Another cause of delay is the practice of keeping fuses of different sizes in a common box. After fuses have been in service for some time the amperage marks tend to become scratched or obliterated, and delay results from mistakes in fuse selection. A 1-amp fuse for a lighting circuit may be put into a control circuit requiring from 3-amp to 25-amp fuses. Standardization of coupling and shackling methods is also important. When small box cars and semi-convertible cars are run on the same line and fitted with several different types of coupling equipment confusion often occurs. Uniform drawbars and cages of sufficient strength to push any car or snow plow on the system are necessary.

EXTERNAL CAUSES OF DELAY

Delays from fires are unavoidable but in many cases can be reduced when the apparatus is being ordered back to headquarters, if the street railway officials request the fire chief to co-operate in giving the company a main line. Funerals often seriously interrupt traffic and often cause hold-ups of from five to twenty minutes in crowded thoroughfares. The passage of an ordinance requiring an opening of 300 ft. between every ten carriages would be a decided help. Drawbridges should not be opened during rush hours, and excavations should not be opened on main thoroughfares during the daytime. So far as possible, work of this character ought to be done at night, and an appeal to municipal authorities to limit the hours of opening to

Boston Elevated Railway Company, Transportation Department Record of Car Delays in Minutes for October, 1912

Div.	Car Body				Mechanical				Electrical				Total				Miscellaneous			
	1912		1911		1912		1911		1912		1911		1912		1911		1912		1911	
	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.	Def.	Del.
1	144	26	110	42	152	30	63	16	301	400	169	354	597	456	342	412	148	495	72	248
2	121	66	134	49	77	50	58	23	184	366	210	245	382	482	402	317	83	380	94	404
3	179	32	138	65	42	19	50	51	306	247	315	242	527	298	503	358	52	197	78	240
4	4	3	55	26	14	55	15	401	27	106	64	331	45	164	134	758	6	35	15	77
5	59	34	70	18	28	10	20	3	178	220	121	93	265	264	211	114	81	311	29	85
6	190	16	106	36	79	45	39	26	122	130	173	259	391	191	318	321	24	62	42	205
7	264	46	200	119	103	16	142	93	236	262	343	567	603	324	685	779	79	215	55	225
9	136	66	168	18	83	47	72	32	214	329	212	281	433	442	452	331	24	100	32	120
Total....	1097	289	981	373	578	272	459	645	1568	2060	1607	2372	3243	2621	3047	3390	497	1795	417	1604

	1912	1911
Total delay for month	43 hr. 41 min.	56 hr. 30 min.
Average delay per defect	0.81 mile	1.1 mile
Average defect per day	104	98
Miles per defect	1255	1255

Standing of Different Divisions for Month of October

Division:	1st	2d	3d	4th	5th	6th	7th	8th
Standing in 1912	5	4	8	1	7	2	3	6
Standing in 1911	2	4	8	7	5	1	3	6

between 6 p. m. and 6 a. m. would be a step in the right direction. Where new buildings are being erected more or less delay is often caused, and the tendency of contractors to occupy an undue share of the street should be officially discouraged. The condition of track is a far more important factor in the punctuality of the service than is sometimes realized. If the track is in poor condition, it protracts the length of stops, since passengers will not walk through cars toward the doors if their footing is rendered more or less insecure by side motion. A change in the roadbed construction such as the installation of longitudinal and cross drains in reservations subject to water accumulation would be a decided help in facilitating car operation at normal speed. Patch paving by company trackmen should also be prohibited on main thoroughfares between 6 p. m. and 6 a. m. It goes without saying that the cooperation of police, fire and other city departments is necessary for the maintenance of a proper schedule. Where practicable light-riding cars should be regulated so that two or three different lines of cars will not be due at junction points at the same time. The provision of short-cut track routes is also a matter worth consideration. On outside sections of the system the use of motor-driven wrecking vehicles should be considered in place of cars and teams. In the urban center it is a question if motor trucks for emergency repairs could cover the field much more effectively than horses.

WRECKING OUTFITS

There is room for a careful analysis of prospective service conditions in connection with the arrangement of wrecking outfits, the laying out of districts to be covered in emergencies, the organization of crews and the provision of suitable equipment with which to pick up disabled cars or broken-down teams. The management should know the average time required for a wrecking outfit to reach the most remote point where trouble may occur. On a typical division, with four carhouses as centers, the average run required was 1.9 miles, and, based upon the usual running time, the interval required for the wrecking car to reach the most distant scene of trouble was about ten minutes. The placing of wrecking tools at various points for the use of street inspectors is a useful policy. The addition of a chemical extinguisher to the regular equipment of a wrecking outfit is a valuable course to follow in connection with the occurrence of fires caused by overheated resistance grids or motor leads.

By the use of a clamp which fits over the head of the T-rail on reservation trackwork much delay can be avoided when jacks are employed under trucks which are derailed with one pair of wheels on each side of the rail. The usual method of getting the truck on the rail is to jack up and block the truck, and then, with another jack at an angle against the corner of the truck frame, to force it upon the rail. Without the clamp it is difficult to prevent the jack from slipping at its base. One of the hardest jobs of the wrecking crew is to deal with a broken axle or truck frame when one corner of the truck frame rests on the pavement. This work has been much lightened by the use of a skid of hard wood about 8 in. high, 20 in. long and 5 in. wide, bound with ½-in. iron. It is lashed to the truck frame and enables the car to be slid home with comparative speed. It is much easier to use and lighter than the usual wheel skid or cradle, can be handled more quickly, and reduces the amount of jacking required. The use of high-powered lights in place of lanterns for night work on wrecking jobs is also an important matter. In one case, where two frogs were not protected by guard rails on account of their location immediately opposite one another, permanent oak fillers were installed at the angles. With these a derailed car can be backed upon the frogs and upon the rail again without waiting for blocking.

RECORDS OF CAR DELAYS

About two years ago a system was instituted in the transportation department of the Boston Elevated Railway Company whereby all delays to a car in excess of 2 minutes were reported by divisions to the superintendent of the day at the main office. This record shows the delay to the car on which the failure occurred, but not the delays caused thereby to other cars. For October, 1911, the total car delays were 56 hours 30 minutes; for October, 1912, they were 43 hours 41 minutes, total defects in the former month being 3047 and in the latter, 3243. The average delay per defect was 1.1 minute in the first and 0.81 minute in the second case. To create rivalry among carhouse foremen it is the practice at their monthly meetings to announce the record of the longest and shortest delays for carhouses of comparable class and size. Occasionally special analyses of the causes of delays are made, a typical week's operations showing the following:

Material	50 min.
Manufacture	4 min.
Unsuitable equipment	35 min.
Improper maintenance	4 hr. 29 min.
Improper operation	2 hr. 19 min.
Track	12 min.
Undetermined	1 hr. 46 min.

The item of proper maintenance included all such troubles as grounded armatures, fields, etc., and unnecessary time lost on account of a failure, as in the case of a motorman who attributed a difficulty to binding brakes when the trouble with the car was a motor breakdown. This caused a loss of 40 minutes when not over 5 minutes would have been required by an experienced man to locate the cause and cut out the offending apparatus.

POWER STATION PROTECTION AT LOUISVILLE DURING THE RECENT FLOOD

During the flood at Louisville the water rose considerably above the windows and doors of the electric power station of the local electric lighting company, of which Gen. George H. Harries is president. Floods, however, are not uncommon in Louisville, although that of this year was unsurpassed as regards volume except by the famous floods of 1884. Hence the engineers of the power station were prepared to combat emergencies of this kind and adopted an ingenious method of making the doors and windows watertight and of preventing the power station from floating away because of its buoyancy when surrounded by water. A part of the equipment of the power station is an ice-manufacturing plant, and as the water rose in the streets refrigerating coils connected with this plant were laid around the edges of the windows and doors, whose chinks were filled with sawdust. After the sawdust became saturated with water it was frozen by means of the refrigerating coils and thus the inflow of water was prevented. To counteract the tendency of the station building to rise when immersed to the depth reached by the water, some water was permitted to run into the basement as ballast. During the flood communication with dry land was maintained by a number of rowboats moored to the chimneys.

Now that the relocation and reconstruction of the Panama Railroad is completed surveys are being made for the transmission of power for the operation of the line by electricity. The Gatun hydroelectric plant which is under construction will supply the energy required under normal conditions, but there will also be a connection with the present steam-driven electric plant at Miraflores. The transmission voltage will be 44,000, and this potential will be stepped down at various distribution centers for running the trains, lighting the canal and supplying the power required for operating the various machine shops, the gates and other appliances at the dams and locks. Bridges of the customary type for carrying the cables, etc., will span the tracks, the distance between them varying from 200 ft. to 300 ft. according to the local curvature conditions of the railroad.

COMMUNICATION

RELATIONS OF STEAM AND ELECTRIC RAILWAY TRAFFIC DEPARTMENTS

Tidewater Southern Railway Company
Stockton, Cal., April 17, 1913.

To the Editors:

I crave your indulgence for a moment for the purpose of calling attention to an item appearing in the Pacific Coast items of last week's *Railway Record,* which reads in part as follows: "The electric lines of California are adding to the burdens of the steam roads by asking for admission to the Transcontinental Scrip Bureau," or words to that effect.

Viewed from an unprejudiced angle, such a contention surely seems to be unfair or the product of an unprogressive theory, and is one which is destined to become shorn at an early date of its moss covering.

Being myself a steam road undergraduate and having for years unconsciously been accustomed to feeling that the electric line, although a factor, was to be considered more or less as an interloper and not a railroad in the regular sense, I can readily appreciate the other fellow's seeming position. These taints of prejudice, however, are due for relegation to the dark ages whence they came. Especially can this be said after one reflects that the B. & O. at Baltimore, the Pennsylvania and New York Central lines at their terminals at New York, etc., which are steam properties by origin and nature, have resorted to electricity as a means of economy and efficiency. Finally within the last few weeks, at a meeting of Pennsylvania Railroad directors, it was voted to electrify at once the Philadelphia terminals and their immediate extensions. So away with these prehistoric relics and their blindness!

The steam roads of California and elsewhere, when operating joint territory with electric roads, should welcome the latter into their tariff, scrip, weighing and other bureaus with open arms. It would seem they should appreciate the willingness of the little fellow, erstwhile outcast, to come into the fold, for by so doing the modern tendency toward uniformity and standardizing generally would but be receiving additional impetus toward its logical goal.

The electric lines of California have but made application for membership in the Transcontinental Scrip Bureau at San Francisco. What can be the objection to their admittance?

The electric and steam lines operate in direct competition between quite a few California points, some of which are of considerable importance, hence have quite a volume of passenger traffic. Can there be any real reason why the public should not be handled on an equality, so far as concerns fares? Do the steam lines advocate that the electric roads be obliged to publish open rates, upon basis of "net fares" to holders of steam road scrip books, or do they anticipate that the electric lines will sit quietly by and permit the steam roads to secure the travel because the electric ones have the higher rates?

Present indications point strongly toward the electrification of all steam lines operating out of San Francisco for a zone extending several hundred miles in any direction. Will such transformation of roads eliminate the lines at issue from participation in local scrip and other bureaus?

Within ten years, in view of the rapid and economical hydroelectric development possibilities of central and northern California, steam roads there will be looked upon as being about as progressive or modern as a "century plant."

With the increasing science of ton miles per train developed in steam road practice, the natural argument is for a reduction in number of station stops. All this affords the electrically operated lines a useful field of endeavor. They distribute and develop traffic under conditions prohibited to and unprofitable in steam operation.

The conclusion is safe and certain that the electric roads are here to stay. So let's get together on lines sufficiently broad to insure efficient service to public and honest returns to stockholders and patrons alike.

L. H. Landis, Traffic Manager.

NEW STREET ORDINANCE IN LOS ANGELES

Upon recommendations of Charles K. Mohler, chief engineer railway department, Board of Public Utilities, the City Council of Los Angeles has revised the ordinance in regard to the space on the streets which can be occupied by standing vehicles and has increased the distance which must now be kept free. The old ordinance allowed 40 ft. from the curb corner. Under the new ordinance the Board of Public Works is authorized to make that distance not less than 80 ft. or more than 150 ft. and to place signs showing the space in which it is unlawful for vehicles to stand.

The new law has been brought about principally by the

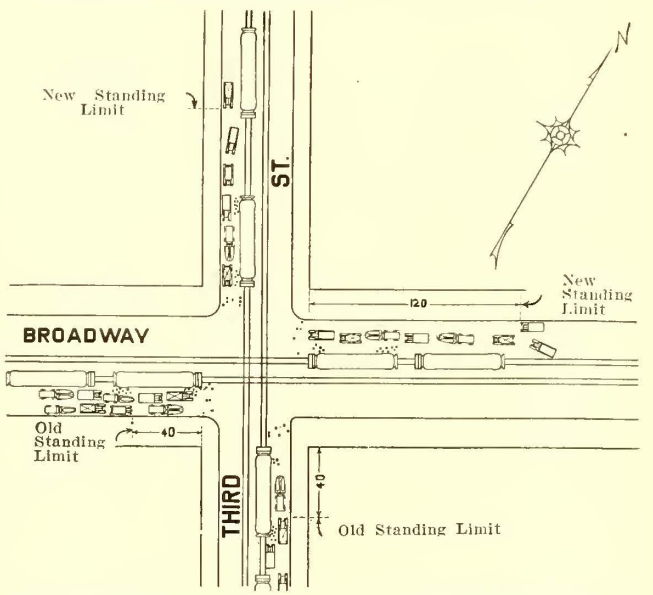


Diagram Showing Position of Cars and Vehicles in Los Angeles with Old and New Standing Limits

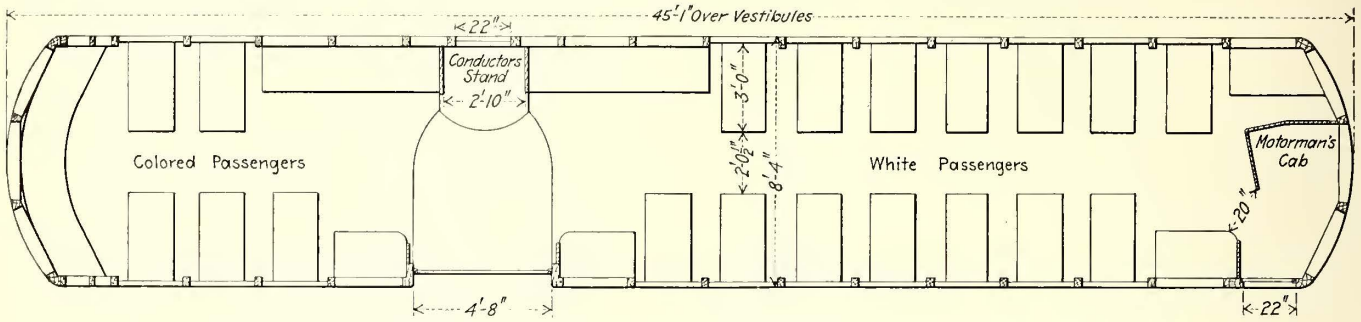
congestion at corners and the danger to the passengers entering and leaving the trolley cars. This condition has been aggravated by the increasing number of motor-driven vehicles which, according to Mr. Mohler, have a low factor of capacity—that is, of number of passengers to the standpoint of space of roadway occupied. The accompanying sketch shows the old and new standing limits and the position of the cars when discharging and receiving passengers. The old and lew limits are shown on both a single-track and the double-track line.

SWISS STREET RAILWAYS FOR 1911

The annual railway statistics of the Swiss government for the year 1911 show thirty-seven purely city railways and 275 miles of route, corresponding to 374 miles of single track, an increase of 9.4 miles compared with 1910. Thirty-one undertakings used direct current, two of them at 800 volts and two at 1000 volts; three of these city lines used three-phase at 550 volts and one used single-phase at 200 volts within the city limits. The rolling stock consisted of forty-five single-truck, one-motor cars; 670 single-truck, two-motor cars; fifty-seven double-truck, two-motor cars; fourteen double-truck, four-motor cars, and 289 trailers—a total of 1075 cars, seating 37,567 passengers. The total gross earnings were $3,064,658, equivalent to 17 cents per train mile. The total operating expenses were 79 per cent of the gross earnings. The number of employees was 4259, or 7.48 per km.

SIDE-ENTRANCE CAR FOR WHITE AND COLORED PASSENGERS.

The Birmingham (Ala.) Ensley & Bessemer Railway has recently purchased from The J. G. Brill Company ten steel arch-roof side-entrance cars of the type shown in the accompanying illustrations. In these cars the side-entrance principle has been adopted as a convenient means for separating white from colored passengers. The general dimensions of this type are as follows: Length over bumpers, 46 ft. 9 in.; width over all, 8 ft. 4 in.; width of double transverse seats, 36 in.; width between transverse seats, 12 in.; width of aisle between transverse seats, 24½ in.; width of main side opening, 56 in.; width of exit door of motorman's cab, 22 in.; width of emergency exit behind conductor's stand, 22 in. The seating plan as reproduced shows that transverse seats have been favored so far as possible without prejudice to insure freedom of passenger movement at the entrance and exit aisles. As the car is operated single-ended, there is but one cab for the motorman, and this is placed in the compartment for white passengers, as indicated.



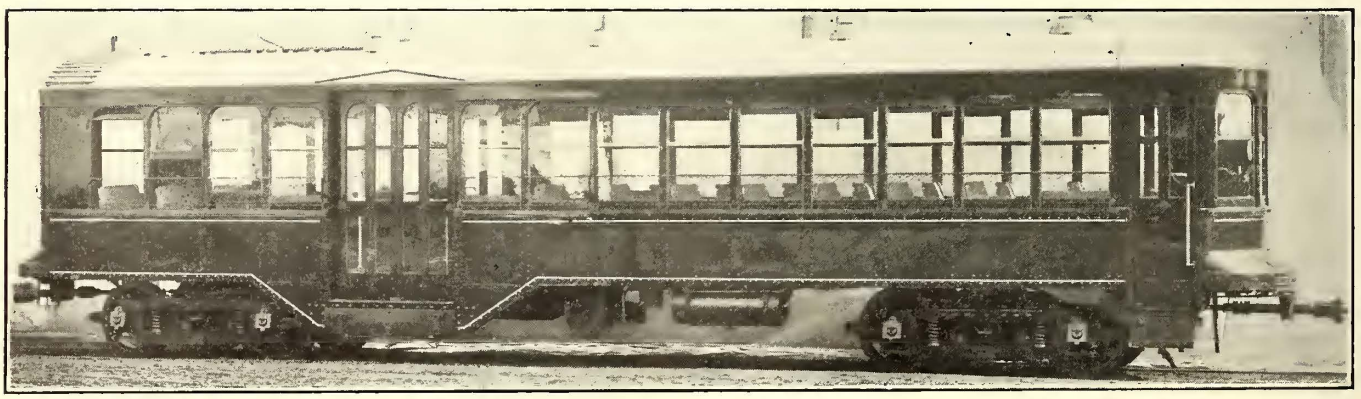
Birmingham Car—Plan of Side-Entrance Car for White and Colored Passengers

The main opening of the car, which is used for the combined entrance-exit aisles to the white and colored compartments, comprises double sliding doors 58 in. wide and a folding step. The exit door of the motorman's cab is an inwardly folding two-leaf door. As the inwardly folding double door behind the conductor is for pole-setting use only, it has no folding step, and, in fact, it is located above the level of the car floor. The steps at the side entrance are low despite the fact that 34-in. diameter wheels are used. The first step is 14 in. from the top of the rails; the next step, which leads to the platform well, or subfloor, is 14 in. high, while the last step—namely, from the well to the main floor—is 10 in. high. In addition, from a point 5½ in. on each side of the doors the main floor is sloped upward 3 in. and the subfloor 1 in.

The conductor stands on the main floor between two longitudinal seats in a niche 34 in. wide, from which position he can face the passengers and control the doors. A triple step for the front exit is obtained by forming a well in the motorman's platform as in the Pittsburgh Railways' pre-payment cars. This arrangement gives three exit steps as follows: 13 in. from main floor to well, 13 in. from well to folding step and 15 in. from step to ground.

The ash side and corner posts are 2⅞ in. and 3⅝ in. thick respectively and measure 30 in. between centers; they are set between and securely bolted to vertical angles that are riveted to the inner faces of the side-sill angles and exterior sheathing. Their upper ends are tenoned into a continuous 2½-in. x 2¾-in. yellow pine top rail, reinforced by a 1⅛-in. x 9¼-in. letter panel. A one-piece belt rail, into which the posts are gained, relieves the top rail of considerable stress along each section.

The most noteworthy feature of the bottom frame is the careful distribution of metal to obtain the greatest possible strength—allowing for a factor of safety of five—with adherence to commercial shapes and flat bars. The side sills are 6-in. x 3½-in. x ½-in. angles and run through from bumper to bumper, except that the sill on the right is interrupted at the front corner on account of the single front exit door. They are depressed 21 in. under the center platform on both sides of the car, and the sill on the right is reinforced under the entrance with a 24-in. x ½-in. steel plate, to the top edge of which a 3½-in. x 3½-in. x ½-in. angle is riveted. This angle forms the outer edge of the center platform. Further reinforcement at the center entrance is given by the ⅛-in. steel side sheathing that extends from the lowest part of the bottom framing to the windows along the entire car body. The left side sill does not require the same degree of reinforcement opposite the entrance as the right sill, as the body framing is not interrupted on that side. The only other longitudinal members are two 5-in. I-beam center stringers in each end, extending from the bumper to the nearer center platform cross bearer. The cross bearers are plate girders, 13½ in. deep at the ends, where they are secured to the side-sill

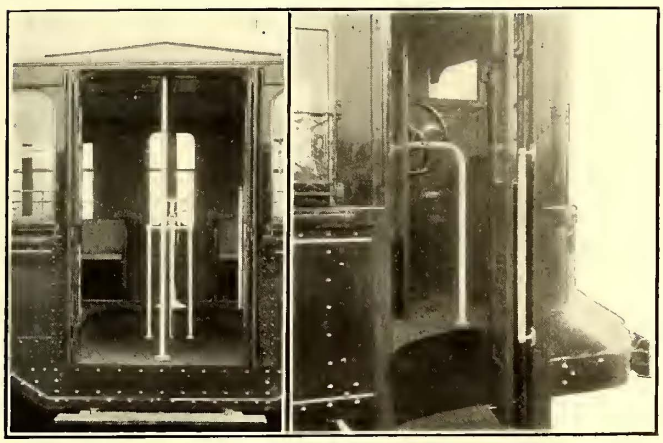


Birmingham Car—Side View, Showing Main Side Entrance and Exit for Two-Compartment Car; Also Front Exit from Compartment for White Passengers

reinforcing plates with angles, and 8 in. deep at the center, and are reinforced along the top and bottom edges with 2½-in. x 2½-in. x ⅜-in. angles. They are connected with 2-in. x 2-in. x ¼-in. angles that act as longitudinal platform-floor supports. The purpose of such heavy cross bearers is to transfer the entire load carried by the center stringers to the sides at the center entrance, where the former are interrupted and, inversely, the load of the entrance back to the stringers. Other crossings are 4-in. channels, which are riveted to the longitudinal members through angles.

Diagonal braces, 4 in. x ¼ in., reinforce the center of the framing against braking strains. Diagonal end braces of 4-in. x 3-in. x ⅜-in. angles distribute shocks, attributable to the draft gear, over the other bottom-frame components. At the right forward corner, where the side sill is interrupted for the low floor of the front exit door, compensation is made for the interruption by two 4-in. channels, forged to a "U" shape, in the horizontal portion of which the subfloor rests, and by a forged angle knee that is riveted to the under sides of the sill and channel on the right-hand side of the car.

The cars are mounted on No. 27-M. C. B-2 trucks having solid forged side frames with integral pedestal jaws and



Birmingham Car—Views of Dividing Aisles in Main Doorway, and of Front Exit

fitted with four GE-216 50-hp motors to give a maximum speed of 60 m.p.h. The car seats thirty-nine white passengers and twenty-two colored passengers, the total seating capacity being thus sixty-one.

The detail weights of the car, as supplied by the manufacturer, are as follows: car body less electrical equipment, 18,000 lb.; electrical equipment, 2800 lb.; air-brake equipment, 1800 lb.; trucks, 16,000 lb.; motors, 11,200 lb.; total weight, 49,800 lb.

SERVICE AND INAUGURAL PERFORMANCES OF BEACH-EDISON STORAGE BATTERY CARS.

The following figures from a cross-country railway show the performance of Beach-Edison storage battery cars. This company now operates three cars on 4.5 miles of track. Operation was begun in 1911 with one car. The low average mileage per car per annum shown in the table is due to the condition that all three cars are run only from June to September. The cars are of the single-truck type, No. 1 design, each seating twenty-eight passengers and weighing 6.5 tons. The battery equipment consists of 105 A-6 cells for traction and five A-6 cells for lighting.

The data covering the operation as well as the car-mile costs for a period of nearly two years are given in the accompanying tables.

Report for June, July, August and September, 1912

Passengers carried	129,500
Energy purchased, 2410 kw-hr.	$846.76
Car miles	22,500
Total weight of car, including passengers, averaged, tons	7.36
Total watt-hour output of cars at motor brushes	66,620
Average voltage of each cell taken as	1.2
Alternating-current power input	1.307 kw-hr. per car mile, or 176 watt-hr. per ton mile
Direct-current power input, assuming motor set efficiency of 70 per cent.	90 watt-hr. per car mile, or 124 watt-hr. per ton mile
Battery output at car motors	374 watt-hr. per car mile, or 51 watt-hr. per ton mile
Cost of energy purchased	3.7634 cents per car mile
Cost of energy purchased	0.5113 cents per ton mile
Cost of energy purchased	2.88 cents per kw-hr.
Battery electrolyte cost	1.29 mills per car mile*

*This is based on the total performance of 59,984 miles made by cars Nos. 1 and 2 before their battery solution was renewed. The railway purchased 1000 lb. of potash solution at 8 cents per lb.

Report of Car-Mile Costs from July 1, 1911, to April 1, 1913, Inclusive

Mileage, 82,450 Car Miles

Maintenance of way and structures	$0.00178
Energy purchased	0.04063
Power plant, wages, materials	0.01357
Maintenance cars, labor and materials	0.00460
Maintenance battery, water and electrolyte, labor and materials	0.00197
Wages, motormen and conductors	0.05566
Miscellaneous equipment, labor and supplies	0.00097
Superintendence	0.00563
General expense	0.00022
Total operating and maintenance expense	$0.12503
Taxes	0.01574
Accidents	0.00109
Total operating and maintenance expense, including taxes and accidents	$0.14182

PERFORMANCE OF POSTON & ALBANY CAR

An account of the New York to Boston run by way of Hudson, N. Y., made on March 6 by the Beach-Edison car was published on page 429 of the Electric Railway Journal for March 8, 1913, but since then the following condensed report has been compiled by H. S. Baldwin and J. C. Glendenin, engineers of the Lynn works of the General Electric Company:

Weight of car without battery and passengers	48,255 lb.
Weight of regular battery	8,525 lb.
Weight of auxiliary battery	8,525 lb.
Weight of battery for light	266 lb.
Weight of accessories on car	500 lb.
Average weight, eighteen passengers on run	2,700 lb.
Total weight (54.37 tons)	68,751 lb.
Number of motors	4
Gear reduction	3.5
Rating of motor, 200 volts at 75 amp.	700 r.p.m.
Type of battery	æ..Edison-A/8/II
Number of cells in each set	250
Actual running time	11 hr. 6 min. 51 sec.
Total distance, miles	306.71
Average m.p.h.	27.6
Total number kilowatt-hours	309.1
Average kilowatt-hours per car mile	1.2
Average watt-hours per ton mile	35.0
Total ampere-hours	1303
Average ampere-hours per car mile	4.25
Average ampere-hours per ton mile	1.24
Average voltage calculated from ampere-hours and kilowatt-hours.	283
Average current calculated from volts and kilowatt-hours	117
Free running, amperes	176
Free running, volts	285
Free running speed, m.p.h.	37
Free running, watt-hours per ton mile	39.5
Free running car friction, pounds drawbar pull	16.4
Maximum speed, m.p.h.	42
Average of accelerating current, amperes	203.7
Total charging time on run	3 hr. 27 min.
Total ampere-hours from charging	275
Amerage charging current, amperes	355
Average charging, volts	429
Total kilowatt-hours, charging	522
Kilowatt-hours discharged by battery during entire trip	219.4
Ampere-hours discharged by battery during entire trip	778
Average voltage calculated from ampere-hours and kilowatt-hours, entire trip	282
Excess kilowatt-hours available at end of run	55
Excess ampere-hours available at end of run	195
Battery efficiency calculated from test figures, per cent.	52.7

Average cell temperatures were taken by E. J. Ross, Jr., at different stages of the trip as follows:

March 6:

8:50 a.m.—Grand Central Terminal, just previous to start, 105 deg. Fahr.

10:25 a.m.—Poughkeepsie, average cell temperature, 100 deg.

2:12 p.m.—Upper Hudson, previous to boost, 97.60 deg.

4:30 p.m.—After boost of two hours at an average of 270 amp, 110 deg.

6:15 p.m.—Springfield, previous to boost, 98.4 deg.

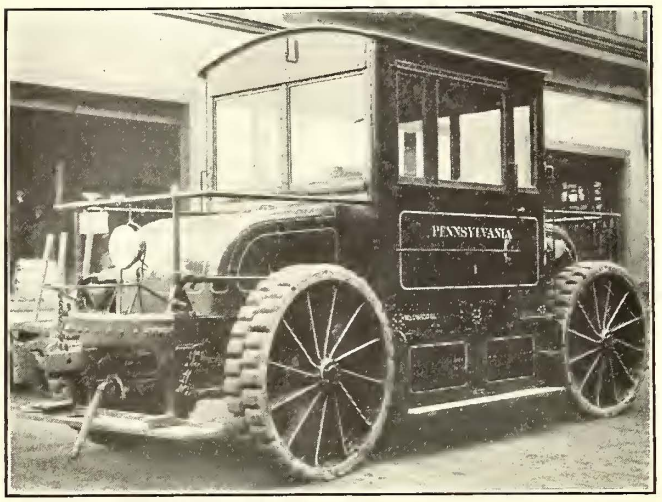
10:50 p.m.—After boost of approximately one and three-quarter hours at 248 amp, 106.8 deg

March 7:

3:45 a.m.—Boston, just previous to completion of trip, 89.6 deg.

ELECTRIC TRACTOR FOR SWITCHING SERVICE IN CITY STREETS

An extraordinarily powerful electric automobile has been placed in the service of the Pennsylvania Railroad at its Jersey City yards for moving freight cars through city streets. It is intended for use where steam locomotives are not available or desirable, and it is arranged to run on the



Storage Battery Tractor for City Switching Service

ground, the 7-ft. gage of its wheels easily spanning the standard track. The car can thus be maneuvered around an ordinary train, since its movement is not confined to the rails. The wheels are 5 ft. in diameter and they have rubber block tires. A normal drawbar pull of 8000 lb. is developed, which can be increased to a maximum of 21,500 lb. if required. Running light, the tractor maintains a speed of about 6 miles per hour.

Energy for the two 20-hp General Electric motors is supplied by eighty cells of Edison A-12-H storage battery, weighing 4350 lb. Herringbone gears connect the motors to the countershafts, a total reduction of 1 to 40 being obtained at the wheelshafts. The tractor utilizes all four wheels for driving, steering and braking. With this arrangement the car can be turned in a circle of 20-ft. radius. By means of duplicate equipment in the cab the tractor can also be operated in either direction from either position. Compressed air actuates the internal expanding brakes in the four wheels and an arrangement of interlocks prevents the controller being operated to turn on power while the brakes are set. Through standard hose connections compressed air is also supplied for braking the freight cars. In over-all length, including the M. C. B. couplers, the tractor measures 23 ft., the chassis being 19 ft. 6 in. long. The wheelbase is 12 ft. The over-all width of the machine is 8 ft. 4 in. and the height 11 ft. 3 in.

The tractor, which weighs 28,850 lb., was built in the Altoona (Pa.) shops of the Pennsylvania Railroad. While being tested at Altoona it successfully bucked a large steam locomotive which was attached to three freight cars and headed against the tractor with a wide-open throttle. The tractor was able to withstand the push from the steam machine and actually moved the cars and locomotive backward.

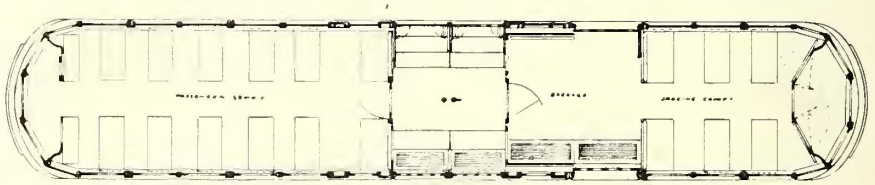
NEW CENTER-ENTRANCE COMBINATION CARS

Two cars designed by W. A. Haller, of the Federal Light & Traction Company, have just been built by the Niles Car & Manufacturing Company for the South Fork-Portage Railway. This road is now under construction between South Fork and Portage by the Portage Construction Company, of which G. U. G. Holman is president. An extension of the line will be made as rapidly as possible so as to operate through cars crossing the mountain range between Johnstown and Altoona. Between South Fork and Johnstown the cars will run over the tracks of the Southern Cambria Railway Company.

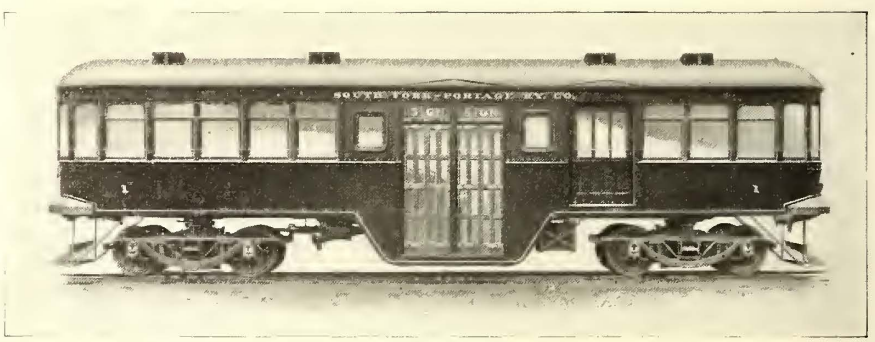
Owing to the almost continuous climb from both Johnstown and Altoona to the summit, it was considered necessary to have cars as light as possible yet with great seating capacity to accommodate the mining population in the small coal towns through which the road runs. In fact, for a considerable portion of the distance, these mining towns are at close intervals, and the traffic at present will be principally local. Larger cars of the same type are contemplated for through service when the road is extended. While the extreme length of the present car is only 45 ft. 7 in. and 44 ft. 7 in. over vestibules, the seating capacity is fifty-six persons. There is also a baggage compartment 8 ft. long which also can be occupied by passengers.

One of the novel features is the folding motorman's cab, which isolates the motorman at the front end and which, when at the rear end, swings transversely with the car and supports two folding seats, increasing the seating capacity by four persons. The left sides of the center vestibule and of the baggage room also are fitted with folding slat seats as it is intended to open only the right-hand side.

Each side of the center vestibule is fitted with four pairs of two-panel folding doors glazed with clear glass from top to bottom, so that the conductor can observe the pavement from his station. These doors are operated by handles from the conductor's station only. The step openings are covered by Edwards automatic steel trap doors.



South Fork-Portage Cars—Seating Arrangement



South Fork-Portage Cars—Exterior View

The entire underframe, side frame and outside sheathing are of steel—the interior finish being of agasote and mahogany. Each car is equipped with four Westinghouse 1200-volt, 75-hp motors with HL double-end control and geared for a speed of 45 m.p.h.

On account of local clearances, the car is mounted with the bottoms of side sills 7 in. above the rails, the first step being 15 in. high. This may, however, be lowered to 11 in. if obstructions permit.

News of Electric Railways

Increase in Cleveland Ordinance Allowance Refused

At its regular meeting on the evening of April 21, 1913, the City Council of Cleveland, Ohio, refused the request of the Cleveland Railway for an increase in operating and maintenance allowances and ordered that a fare of 3 cents cash or two tickets for 5 cents, with a charge of 1 cent for transfer, be put into effect on May 1. The company immediately demanded arbitration under the terms of the Tayler ordinance and announced the selection of C. N. Duffy, vice-president of The Milwaukee Electric Railway & Light Company, as its arbitrator. A. B. DuPont was selected by the city and these two men must select a third within a reasonable time or allow Judge Day of the federal court to make the selection.

The city seems determined to force a decision upon the important disputed point as to whether the company has the right to spend more than the allowances made in the Tayler franchise for operation and maintenance. The city claims that if the company has this right the whole principle of city control, one of the two basic principles of the franchise, fails. On the other hand, President Stanley of the company asserts that if the company cannot exceed these allowances when need be, the other fundamental principle of the franchise, service rendered at cost plus 6 per cent, is denied.

It is said that Mayor Baker had prepared a proposition to be made at a meeting of the street railway committee the morning before the Council meeting, in which the company would have been allowed an increase of ½ cent per car mile for operating expenses on condition that it would agree to keep within that allowance in the future. The company was unwilling to make such an agreement and believes it not in keeping with the spirit of the Tayler franchise.

The letter from Mr. Stanley demanding arbitration follows:

"We regret that you refused our request for an increase in the maintenance and operating expense allowances provided for by our franchise, and we now respectfully ask for an arbitration to determine the amounts per car mile that should be allowed for maintenance, renewal and depreciation of our property, and to enable the company 'to meet the legitimate expenses of operation, insurance, accident and damage claims,' 'to make good any deficit' now existing and 'to prevent any deficit' in the future on account of maintenance or operating expenses; and we name as our arbitrator C. N. Duffy, Milwaukee."

At a meeting of representatives of the Cleveland Railway and the employees on April 18, it was agreed to allow the present scale of wages to continue for another year. President Stanley arranged to meet a grievance committee of the men relative to minor complaints, as in the past, and this was satisfactory to the men. In a statement issued after the withdrawal of the demands, the men said they realized that the company could not increase their wages while it received a 3-cent fare.

A 3-cent fare will be put into effect on May 1, 1913, in that portion of the city which was formerly Newburg City.

Detroit's Charter Commission

In the organization of the charter commission at Detroit, Mich., a committee on municipal ownership will be named to formulate the amendments relating to that subject. Herbert S. Bigelow, Cincinnati; Mayor Newton D. Baker, Cleveland; Mayor Brand Whitlock, Toledo; John Z. White, Chicago; Roger I. Wykes, Grand Rapids, and former Comptrollers Herman A. Metz and Bird S. Coler, New York, have been invited to speak in Detroit on different phases of charter revision. The City Council appropriated only $500 in advance for the charter commission. William T. Dust is chairman of the charter commission and the members of the municipal ownership and public utilities committee are Messrs. Ingram, Ahern, Dandell, Fischer and Funke. Mr. Campbell is chairman of the civil service committee.

What is known as the Keifer-Penniman ordin[illegible] ing the number of persons that shall be carried [illegible] car, is pending in Council. At a meeting of the [illegible]inance committee recently Henry Bullen, general superintendent of the Detroit United Railway, argued that the ordinance should make it a misdemeanor for a person to board a loaded car. Conductors and motormen have no police powers and cannot enforce such an ordinance. In its present shape, the ordinance puts the entire burden of enforcement upon the company.

Corporation Counsel Lawson has rendered an opinion to the effect that the city cannot issue bonds to purchase storage battery cars for operation on Junction Avenue, as has been proposed.

Report on Toronto Traffic—Municipal Ownership Proposed

The report on the street railway situation at Toronto prepared by Bion J. Arnold, Chicago, Ill., has been made public. Briefly, two plans are proposed. One contemplates the operation of all lines under one management, the other provides for an independent system with an entrance into the heart of the city's business district for many of the proposed civic lines, so planned as to be eventually co-ordinated with the present system when the franchise expires. The total cost of additions to the present system, as proposed by Mr. Arnold, is $8,762,000 for 127 miles of new track, 600 pay-as-you-enter cars, carhouses, substations and other equipment. It is suggested that this expenditure should cover a period of five years. An estimate of the probable earnings, if the improvements are completed in 1917, is made as follows for 240 miles of trackage: gross earnings, $10,800,000; operating expenses, taxes, renewals, pavement charges, etc., at 70 per cent, $7,560,000; net earnings, $3,420,000.

The rules of procedure were suspended in the Ontario Legislature recently and a bill authorizing the city to proceed with its plans to acquire the property of the Toronto Railway and the Toronto Electric Light Company was put through its first and second readings. The measure would authorize the city to purchase the properties and place their management and control with a commission of three or five men. Approximately $21,000,000 is the figure at which the city may acquire the Toronto Railway according to the statement made by Mayor Hocken at a special meeting of the City Council recently. At this meeting the Mayor asked the confidence of the members, citizens and the press until such time as he could submit the proposition in detail. The purchase price of $21,000,000 for the railway is on the basis of $160 a share for the stock. The total figure for the Toronto Electric Light Company was not given, but Mayor Hocken announced that this was on the basis of approximately $135 a share for the stock.

The Toronto *Mail and Empire*, commenting editorially on the proposal of Mayor Hocken for municipal ownership, said:

"That the public have heard nothing of the negotiations, or even that negotiations were pending, is evidence that its representatives in the matter had at least this qualification for their work, that they were able to keep their own counsel.

"It is understood that the several stumbling blocks to agreement in times gone by have all been removed and that the way has been paved for the city's undertaking of the enterprise now carried on by the Toronto Railway and possibly that carried on by the Toronto Electric Light Company. This preliminary and preparatory work includes the disappearance of difference in the matter of assuming the railway company's long-term contract with the Electrical Development Company, the reaching of a basis on the radial railway question, the finding of terms for the purchase of the Toronto Electric Light Company, the drawing up of a scheme of government for the street railway system, the financing of the transaction, and other difficult points.

"It is believed that the legislation which is to be introduced provides for all the conditions to be satisfied. This

legislation would enable the City Council to submit to the ratepayers, possibly as early as next June, a by-law to authorize the raising of about $30,000,000 for the purchase of the stock of the companies concerned. We learn that for the financing of the transaction the city has already the assurance of the purchase of a sufficient issue of 4½ per cent bonds at a price close to par. The ends of the radial lines within Toronto would be transferred to the city along with the Toronto Railway system, and the radial railways are to have entrance to the city. Those railways are being linked up by a line taking the suburbs within its sweep."

The Toronto Railway has replied to the city's request for more cars and new lines. The company says that it is turning out cars as fast as possible. It agrees to construct the Teraulay Street line as soon as the location is decided on by the engineers. It agrees to extend the Wilton Avenue line to Teraulay Street and is prepared to build lines on Pape Avenue and Greenwood as soon as the grade crossings on those streets are eliminated. The company is willing to extend the Dupon Street line along Royce Avenue, but thinks that the extension of the Harbour Street line would give better service. The company objects to the Bloor Street extension west. It does not consider the proposed Christie, Clinton, Claremont, Niagara and Bathhurst Street extension necessary at this time. Regarding the Dufferin Street line the company prefers to decide this matter next year. The experts recommended that this line be constructed in 1915.

Concern for Boston Elevated Expressed by Mayor

Mayor Fitzgerald of Boston, Mass., who not so long ago called attention to the investment of Massachusetts capital elsewhere than in that State, in an interview in the Boston *Herald* recently in regard to the Boston Elevated Railway said:

"I appreciate that it is not the popular thing at present for a man in public office to champion a public service corporation, but I think the time has come when the public who use the Boston Elevated Railway should look the local transportation problem square in the face. To-day Boston Elevated stock sold on the Boston Stock Exchange at $92 a share. This is less than one-half of the price at which the stock sold twelve years ago. It must be obvious that something is the matter and it is a problem to which the attention of all fair-minded citizens of the community should be directed. Ten years ago the company issued some of its stock at $165 a share, with the approval of the Massachusetts Railroad Commission. Only a few weeks ago the company sold some of its stock to the public at $105, with the approval of that same commission, and even to-day stockholders are paying an instalment upon it.

"The employees of the company have presented demands for an increase in pay. The men ought to receive a fair living wage and we all are in sympathy with them in their efforts to better their condition. But how are they going to get an increase if the company is not in a position to pay out any more money? The stockholders have put the money into the development of our local street railway system and they are entitled to a fair return on their investment. They are entitled to 6 per cent and they must have 6 per cent. I pity a community which is not willing to allow a fair return on the actual capital invested in the development of its local transportation system.

"The situation has reached a point where it should engage the attention of public men. The time has come when consideration must be given to how far a street railway can carry a person for 5 cents and pay its own way. When we go into a store to purchase five yards of cloth, we pay for five yards. In Europe when a man goes to ride on a street railroad he pays so much for the first mile and so much more for the second. In other words, in buying other commodities, or even in street railway systems in other countries, a man pays for what he gets and not a nickel for an indefinite service as he does here. I do not know of any reason why a man should be carried from Mattapan to Arlington for a nickel when it must be very obvious that the carrying charge to the company is more than this.

"A year ago, when the employees' strike was on, I told the employees that there was a limit to what the company could stand. If the men were to get what they ought to in the way of pay, I told them that they ought to see to it that the public pays the company more for the service it receives. The company is paying the interest and sinking fund requirements on more than $20,000,000 of subway bonds and also a big franchise and property tax. The public is crowding the company too hard. I believe the public in this community wants to do the right thing. If the public was properly educated as to the real condition of affairs, I am confident it would want to do the right thing. I believe it would be willing to pay an amount for the service it receives sufficient to allow the company to pay a fair return on its capital and at the same time to insure an adequate wage for the company's employees."

Report on Proposed Subway in Philadelphia

A. Merritt Taylor, transit commissioner of Philadelphia, submitted a report on April 16 to Mayor Blankenburg in regard to the proposed subway on Broad Street. In the report the cost of construction is estimated at $30,000,000, exclusive of interest during construction. The plan comprises a subway under North Broad Street, consisting of four tracks to Allegheny Avenue and two tracks to Olney Avenue, with a suitable two-track delivery loop in the business district and a two-track subway on South Broad Street to Oregon Avenue, with an extension southwardly to League Island. The cost of equipping this line by the operating or lessee corporation, including interest during construction, is estimated by Mr. Taylor at approximately $8,000,000. This comprises the items usually furnished by the operator, of track, signal and station equipment, of track, stock, feeders, substations and their electrical equipment, storage yards, shops and offices, and assumes that electrical power will be purchased.

Mr. Taylor estimates the income and expenses as follows: gross revenue, $3,600,000; operating expenses and taxes, $1,900,000; net earnings, $1,700,000. This, he says, equals approximately 4½ per cent upon an investment of $38,000,000.

He believes that in succeeding years, owing to the natural growth of traffic, the increased profits will be more than a sufficient inducement for a lease to provide for the difference during the first few years between this 4½ per cent and the interest charge on the securities representing cost of equipment to be issued by the operating corporation plus the sinking fund payments, which, he believes, should begin from five to ten years after the commencement of operation and should increase by sliding scale.

Mr. Taylor also reported on proposed elevated lines to Frankford and Darby, which, he believes, would show a net income of about 5 per cent on the cost of construction and equipment. The report is to be followed by another containing further information bearing upon the rapid transit situation in Philadelphia. Commenting upon this forthcoming report, Mr. Taylor says:

"The figures have been carefully compiled by leading experts of the country, and it is believed that this report will represent one of the most complete studies of this subject which have ever been made and will provide Councils with information upon which they can base an intelligent and sound decision regarding the extent and details of the transit problem."

Appointments to Missouri Utility Commission

Governor Major of Missouri has announced the appointment of John M. Atkinson, former assistant attorney general; John Kennish, former Supreme Court judge; H. B. Shaw, dean of the engineering department of the Missouri State University, and Frank A. Wightman, of the Missouri Railroad Commission, as members of the Public Service Commission created by the recent Assembly. Mr. Wightman's term will expire on April 15, 1915. Mr. Shaw and Mr. Kennish are to serve four years. Mr. Atkinson is to serve for six years. This leaves one member still to be appointed. Mr. Atkinson, who has been elected chairman of the commission, and Mr. Shaw are Democrats, while Mr. Kennish and Mr. Wightman are Republicans. It is announced that John A. Knott, of the Railroad Commission, will be appointed State coal oil inspector and that

James Bradshaw, the third member of the Railroad Commission, will be appointed State warehouse commissioner.

The question having arisen in regard to the present status of the Public Service Commission of St. Louis, City Counselor William E. Baird of the city reported to the Municipal Assembly in part as follows:

"The local body may continue to make investigation concerning matters connected with franchises of public utilities and violations of them, in order that the best interests of the city may be protected by the proper authorities; to investigate methods of operation, facilities furnished and quality of service given, in order that the Assembly may, if it sees fit, cause the matter to be brought before the State Commission, or in order to afford the results of its investigation to the public who may desire to take such action, and to furnish information to the Municipal Assembly concerning the granting of its consent for the operation of a street railroad or the execution of contracts between the city and the public utilities companies. I am of the opinion that the city has the power to continue the commission for these purposes and that the ordinance with the modifications mentioned continues in force until repealed."

Supplementary Report on Montreal Traffic

John P. Fox has submitted to the Montreal Board of Trade a report on Montreal traffic conditions supplementing that which was abstracted in the Electrical Railway Journal of March 22, 1913, page 560. In this report Mr. Fox suggests that the question of smoking on cars be decided by public vote as was done last year in Kansas City. He does not believe that subways should be constructed for the use of cars of surface type, and points out that several important streets could readily be supplied with an extra track if the city would give permission. Even if Notre Dame and St. James Streets are not double-tracked, a great improvement will be effected if the speed of cars in taking junctions and intersections is accelerated. Congestion would be relieved and greater seating capacity afforded by using double-deck or trail cars. If the latter, they should be of low-floor design in order to make them more attractive than the motor cars.

The storage of cars at a downtown terminal would also tend to relieve rush-hour conditions. For a city like Montreal double-end cars would be preferable to the single-end cars now standard. The one-man car is suggested for use on suburban lines. In addition to proposing improvements in minor equipment such as fenders, heating, car signs and installation of trolley catchers, Mr. Fox suggests that a thorough study be made of the Montreal transit situation before the Montreal Tramways undertakes with or without the co-operation of the city to expend large sums for permanent improvements.

Petition of Buffalo Employees Presented

The grievance committee representing the employees of the International Railway, Buffalo, N. Y., called on E. G. Connette, president of the company, on the morning of April 21, 1913, and laid before him a petition covering the complaints of the men. This was in accordance with the provisions under which the men returned to work following the recent strike. Mr. Connette discussed the contents of the petition briefly with the men and then asked that another meeting be arranged for April 28. The committee agreed to this. Following the meeting Mr. Connette issued this statement:

"The committee called on me this morning and presented a petition covering its complaints, grievances and demands. After some preliminary remarks, the meeting was adjourned until 10 a. m. Monday, April 28, in order to give the company an opportunity to analyze the requests of the men, so that they could be discussed intelligently at the next meeting."

The petition submitted by the committee is said to embody in detail every demand originally made by the men, namely a flat rate of wage of 32 cents an hour, time and one-half for all time worked over the daily schedule, 75 per cent of all runs to be completed in eleven hours, and nine hours' time to be paid for all runs of less than nine hours.

Franchise Applications in Connection with Newark Terminal Improvement Plans

Amended plans of the Public Service Corporation of New Jersey for the improvement and extension of its electric railway service in Newark have been presented to the Board of Works for its approval. The company has submitted twenty-seven applications for franchises for new lines, extensions and connecting links. Most of the franchises desired are for lines contemplated in connection with the new terminal building to be erected in Park Place, Newark. They are made chiefly under the provisions of the law passed by the recent Legislature, which permits the granting of franchises for connections and extensions not exceeding one-half mile long, without the consent of the abutting property holders. One of the applications is for a subway in Cedar Street to extend into the proposed terminal building, carrying from many surface lines cars that will be diverted from their present routes. Another application is for the proposed overhead road to carry cars into the terminal from Mulberry Street.

New Franchise in Bangor

The Bangor Railway & Electric Company, Bangor, Maine, has succeeded in renewing its franchise in the city streets of Bangor, Maine. The franchise under which the company has been operating was awarded originally to the Bangor Street Railway in 1887 and expired in 1912. The Bangor Railway & Electric Company, the successor of the Bangor Street Railway, has been endeavoring for more than a year to renew the grant. Under the franchise, the company receives practically the same powers which were given to the Bangor Street Railway, but the rates of payment have been modified.

New Chicago Electrolysis Ordinance Now Effective

The new electrolysis ordinance passed by the Chicago City Council on July 15, 1912, became effective on April 15, 1913, or nine months after its passage, as required by the enacting clause. Reports of the hearings held by the gas, oil and light committee of the Chicago City Council prior to the passage of the ordinance were published in the Electric Railway Journal. It will be remembered that the requirements of the proposed electrolysis ordinance include the following principal features:

1. Allows use of grounded return.
2. Maximum drop between any two points on the return system shall not exceed 12 volts.
3. Requires a potential gradient not to exceed 1 volt per 1000 ft. within a radius of 1 mile of the city hall, and 1 volt per 700 ft. for points outside of this territory.
4. Requires the addition of a drainage system to protect underground structures.
5. Limits the amount of current on pipes and cable sheaths.
6. Provides for circuits and recording instruments to determine whether the requirements as to maximum drop are fulfilled.
7. Provides for equipment at each power station to record and limit the maximum current drained from metallic substructures to less than 10 per cent of the total current output of the station.
8. Allows the companies a period of nine months to comply with the conditions of the ordinance.
9. Repeals ordinance of Feb. 1, 1909, governing ground return systems.

On April 15 Ray Palmer, city electrician, sent a notice to all the surface and elevated railways, as well as the Illinois Telephone & Telegraph Company, which operates an electric narrow-gage freight subway underneath the business district of the city, advising them that the ordinance was effective. Mr. Palmer also asked for permit to enable himself or his representatives to make the inspections required under the ordinances at the generating plants and substations of the various companies. He also said that he would be glad to co-operate with the engineers of the companies in carrying on the inspections and tests. During the dis-

cussion of the ordinance all of the transportation companies affected have held that the ordinance cannot be complied with literally, but have either installed or are arranging to install additional substations and have extended the drainage systems, portions of which were under way when the ordinance was passed.

Other specific requirements of the electrolysis ordinance provide that the return current on pipes and cable sheaths must not be greater than 0.5 amp per pound-foot for calked cast-iron pipes, 8 amp per pound-foot for screwed wrought-iron pipe and 16 amp per pound-foot for standard lead or lead alloy sheaths and cables. All uninsulated return current systems must be equipped with insulated pilot wire circuits and voltmeters, as well as recording ammeters and automatic reverse load or overload circuit breakers which will record and limit the maximum amperes drained from all the metallic work, excepting return feeders, to less than 10 per cent of the total output of the station. It is the intention of the city electrician to prepare accurate chart records obtained from daily readings to show the difference of potential between the negative busbars in each station and at least four extreme limits on the return circuit in the territory served. The penalty clause made a part of the electrolysis ordinance calls for a fine of not less than $50 nor more than $200 for each failure to comply with its provisions. Each day's operation of the equipment contrary to these provisions is to be considered a separate offense.

Changes on the New Haven System

Announcement has been made that E. H. McHenry, vice-president of the New York, New Haven & Hartford Railroad, who recently sent in his resignation to take effect on May 1 next, will form a partnership with W. S. Murray, now chief electrical engineer of the company, who will also retire from his present position May 1. The new firm, to be known as McHenry & Murray, engineers, will open an office in the Second National Bank Building, New Haven, as railway engineers and will take over practically the entire electrical engineering force of the New Haven Railroad and will direct all the new electrification work of that company as consulting and constructing engineers. This means that the members of the firm will have charge of the completion of the electrification between Stamford and New Haven and of all the proposed and projected work, including the electrification of the Boston & Providence division and the Dedham branches, the improvement of the Boston terminal and other work still under consideration. The firm will be prepared to undertake, however, other railroad work and already has been brought into consultation in regard to several important electrification projects in the West

The long experience of both members of the firm with railroad work and the electrification of the New Haven system, during which they have supervised the expenditure of more than $15,000,000 and the conversion of some 550 miles of track, well fits them for the field in which they will engage, especially as recent decisions have ratified their application of the a. c. overhead system in the field of heavy electric traction. Their familiarity also with the operating department of railroads will enable them to co-operate especially closely with existing organizations without creating the necessity for many outside overhead charges. While the firm will pay special attention to the electrification of suburban and trunk-line railroads and the design of freight and passenger terminals, it will be prepared also to furnish plans and estimates and supervise other allied lines of railroad work.

Service Resumed in Corpus Christi.—The Corpus Christi Street & Interurban Railway, Corpus Christi, Tex., has resumed its railway service. The operation of cars has been suspended since Feb. 19, 1913, during rehabilitation.

Change of Address of International Association.—The International Street & Interurban Railway Association, with headquarters at Brussels, has moved its main office from 15 Avenue de la Toison d'Or to 23 Rue d'Arlon, Brussels.

Service Resumed in Paducah.—The first electric railway service since the early April flood was given Paducah, Ky., on April 12 by the Paducah Traction Company, the company's power house and many of its lines having been under water for ten days or more during the 55-ft. stage at the Western Kentucky point. The company is busy repairing the damage done to its property by the flood.

Electrification of Branch of Norfolk & Western Railway.—The Norfolk & Western Railway, Roanoke, Va., according to L. E. Johnson, the president, is arranging to electrify its line from Eckman to Bluefield, 27 miles. The preliminary work in connection therewith is now under way, but the plans are not sufficiently advanced to give out any details as yet. Negotiations are in progress with the Appalachian Power Company, but whether the company will take power from it or not is as yet undecided.

Protection from Flood Proposed at Louisville.—Frank H. Miller, superintendent of motive power of the Louisville (Ky.) Railway, and president of the Engineers and Architects' Club of that city, has appointed a special committee of club members to investigate the practicability of building a retaining wall about the "Point," an industrial district of the city subject to flood in times of high water in the Ohio River. The wall, which, it is proposed, will be erected through the co-operation of federal, State and municipal authorities, will not only protect the Point but will also extend along the river front and protect the Campbell Street power plant of the Louisville Railway, a structure which was threatened during the high-water period early in April and was saved only by the fact that the rise of the river was not so disastrous as in 1884.

Tunnels to New Jersey Suggested Instead of Bridge.—The New York State Bridge and Tunnel Commission, in its report filed with the Legislature at Albany, strongly urges the construction of a tunnel rather than a bridge to connect New York and adjacent suburbs in New Jersey. The cost of two tunnels across the Hudson River is estimated at $11,000,000, while the approximate expense of a suspension bridge across the river at Fifty-seventh Street is placed at $42,000,000. The location of the first interstate tunnel is suggested from the foot of Canal Street, New York, to the extended line of Twelfth Street, Jersey City. According to the recommendations of the engineers, a pair of tunnels should be constructed at this point each with a roadway 17 ft. wide, one for east-bound and the other for west-bound traffic. Such tunnels would have a capacity for 5,000,000 vehicles yearly.

Scranton Railway Contracts for Central-Station Energy.—The Scranton (Pa.) Railway, a subsidiary of the American Railways, Philadelphia, has signed a contract with the Scranton (Pa.) Electric Company for all electrical energy required by it for the operation of its street-railway system. The contract becomes effective Oct. 1 and is operative for twenty years. The load will range from 5000 kw to 6000 kw, and by the terms of the contract the Scranton Electric Company will lease the 1500-kw station of the railway and acquire a culm bank owned by the latter company. The 1500-kw station is comparatively new and contains a single Rice & Sargent engine and railway generator. The equipment is operated non-condensing and, the coal from the culm bank costing about 50 cents a ton in the bins, the cost of energy at the switchboard is about 8 or 9 mills. The old station of the railway company will be dismantled, but the 1500-kw station will be held in reserve.

Appointments to Indiana Commission.—Governor Ralston of Indiana has named three members of the Public Service Commission of Indiana, which is to begin its duties on May 1. Thomas Duncan, Democrat, Princeton, and James L. Clark, Republican, Danville, have been appointed to serve four years, and Charles J. Murphy, Democrat, Brookston, has been appointed to serve for two years. John F. McClure, Anderson, and Frank E. Payne, Jeffersonville, the two members of the Railroad Commission of Indiana whose terms have not expired, are continued in office under the utility commission act. Burt New will be the general counsel of the commission and will serve as legal adviser of both the Governor and the commission. Mr. Duncan will be the chairman of the commission. He was appointed as successor to W. J. Wood, chairman of the Railroad Commission, whose term expires on May 1, the date on which the utility act takes effect. Mr. Wood has served eight years as a member of the Railroad Commission.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

ILLINOIS

Senator Connors has introduced Senate Bill No. 382, which is an anti-pass law, applicable to electric railways as well as steam railroads. It prohibits giving passes to all persons except employees and their families, agents of other lines, watch inspectors, surgeons, attorneys at law, annually retained, except those who are members of the General Assembly, etc. Senate Bill No. 399 is to the same effect, except that it does not provide that passes may be issued to retained attorneys who are not members of the General Assembly.

Senator Shaw has introduced a bill which is a new "full train crew" measure, including electric railways in its provision. Senator Beall has introduced a bill requiring every common carrier of passengers, except street surface railways, to furnish its passengers or attendants with seats and transportation. A fine of not less than $100 or more than $500 is provided. The "Jim Crow" passenger coach bill introduced by Senator Campbell, providing for separate coaches or compartments for negro passengers, was killed in the sub-committee of the Senate.

The Senate bill authorizing cities to acquire, construct, own and lease street railways and to provide the means therefor has been reported back by the committee on public utilities and recommended for passage. The bill provides that every city can own or operate railways and lease them to any incorporated company for not longer than twenty years. A three-fifths vote of all the voters of any city is necessary before a grant becomes effective. Any city can incorporate, in any franchise granting a right to construct or operate street railways, a reservation of the right on the part of the city to take over all or part of the street railways at or before the expiration of the grant upon such terms as are provided in the grant. If the city does not exercise this option and grants a right to another company, the new company shall purchase and take over the property of the old one on the terms on which the city might have taken it over.

Representative Clyne has introduced a bill giving any city power to acquire, construct, own and operate any public utility for not longer than twenty years. This bill is similar to the Senate bill to the same end, but only a majority vote of the voters of the city is required. Any utility may be taken over by the city by an agreement with the company or condemnation by law. The same measure has been introduced by Senator Piercy in the Senate.

The bill introduced by Senator Keller providing for semi-monthly pay for all wage earners in the State has been reported out of the Senate labor committee with a recommendation that it pass.

Street railway companies in cities of more than 100,000 population may be taxed for the benefit of the teachers' retirement and pension fund in a bill introduced into the House by Representative Hubbard by request.

Representative Clyne has introduced a bill appropriating $300,000 for salaries and expenses of the State Public Utilities Commission for a two-year period beginning July 1, 1913.

The Dailey public utility bill provides for one commission for the entire State. There are to be five members of the commission, each to receive a salary of $10,000. Two of these are to be from Chicago, one from northern Illinois, one from central Illinois and the remaining member from southern Illinois. The bill provides for uniform accounting, the supervision of stock and bond issues, power to investigate the affairs of utility companies, power to make physical valuations, to fix rates and to make rules and regulations necessary to conduct a just and equitable system of regulation. The bill does not affect the existence of the present Railroad and Warehouse Commission, although the committee recommends that ultimately this commission shall be abolished. It is provided in the bill that a tax of $100 for maintaining the commission be made upon each utility company in the State, with an additional imposition of one-tenth of 1 per cent upon the gross earnings of such companies. In the judgment of the Dailey committee a single commission for Illinois would require an expenditure of about $400,000 a year.

MASSACHUSETTS

Governor Foss has signed the bill extending the powers of the Railroad Commission and the Gas and Electric Light Commission to the investigation of the books, accounts, records, contracts and memoranda of voluntary associations or holding companies owned by the same interests which control public utility corporations under the jurisdiction of either board or which hold the securities of such corporations. An important feature of the law, which is Chapter 509, Acts of 1913, is a provision that nothing in its terms is to be construed as requiring either board, in making any recommendations, rulings or orders with respect to rates charged or the service furnished by any corporation subject to the supervision of either board, to take into consideration any certificate of participation or shares issued under a declaration of trust and representing the beneficial interest in the securities or notes of such a corporation. The Senate has ordered the Boston Transit Commission to report the probable cost of extending the Boylston Street subway to the Post Office Square district instead of terminating it at Park Street. The change in route, if adopted, is likely to mean facilities for the exchange of traffic between the new subway, the Tremont Street and Dorchester subways and the Washington Street tunnel at the points of geographical intersection.

NEW JERSEY

Governor Fielder has signed the House bill giving the Board of Public Utility Commissioners authority to direct street railways to place tracks, wires and appurtenances on certain public bridges when there is a dispute as to the right-of-way between the railway company and the municipalities. The Governor has signed the bill limiting the speed of vehicles of less than 6 tons to 15 m.p.h. when crossing bridges and of vehicles of more than 6 tons when crossing such structures to 6 m.p.h. He has also signed the bill increasing the annual appropriation of the Board of Public Utility Commissioners from $100,000 to $200,000. The Governor has vetoed the bill giving the Board of Public Utility Commissioners power to authorize electric railways to operate freight cars through municipalities which object to the operation of such cars.

NEW YORK

The following radical bill, known as the Cronin measure, has been passed by the Assembly and is now in the Senate:

"All motormen engaged in operating electric multiple-unit trains with one or more cars with high-speed brakes or electric engines or gasoline engines or other power must have at least one or more years' experience on steam or electric railroads and must be familiar with train orders, with the standard code of signals, hand signals and book of rules before operating a passenger or freight train in the transportation service. A record of such experience and of the time of entry upon such service shall be made by the company and furnished to the Public Service Commission in respect to each such employee at the time of the beginning of such employment. Employees taken from different departments of the train transportation service to be made motormen on elevated or subway trains must enter into the yard service for at least one year for the purpose of becoming familiar with the hand signals and book of rules, standard code of signals, train orders, the handling of motor cars and the making up of trains and the nature of the power equipment on such railway, before being permitted to move a motor car or train on any part of the main track of such railway. Such employees during such probationary period shall be classed, as at present, motor switchmen. A record as to such employees shall be kept by the company and furnished to the Public Service Commission when they enter such service, relating to the same matters as the record first above mentioned. A violation of the provisions of this section by any railroad, corporation, officer or servant thereof, or by any such employee, shall constitute a misdemeanor, punishable by imprisonment for not more than one year or a fine of $500, or both. This act shall take effect immediately."

The proposed workmen's compensation act was made a special order of business in the Senate on April 22 after hanging fire all through the session. A sub-committee of the judiciary committee is at work on a compromise.

OHIO

The public utilities committee of the Senate at its session on April 17 undid the work of the House of Representatives by reinserting practically all of the provisions of Sections 32 and 33 which had been taken from the Mills public utilities bill before it was passed by the lower branch. These sections provide that any stockholder, bondholder or other persons pecuniarily interested may apply for a rehearing before the commission. The bill provides for a physical valuation of all utility corporations, including railroads. The House intended to omit railroads, since the Interstate Commerce Commission will soon make a valuation of these properties. The bill, if enacted as it stands, will legislate out of office all three of the present members of the Public Service Commission and remove the maximum expense limit of the commission, which has been $75,000 a year in the past.

A second Mills bill, which was passed by the House recently, provides for the issue of bonds in small denominations by municipalities to secure funds to construct or purchase public utility properties, but specifically states that in case of deficits in the receipts of municipally owned utility properties the shortage cannot be made up from a tax upon the people. Bonds for acquiring any utility may be issued only when the income from the property is sufficient to pay operating expenses and interest charges, besides providing proper amounts for a sinking fund. The bonds may be considered outside the debt limit, but are subject to a referendum under the Crosser act.

Every franchise in the State, with the exception of street railway grants, could be terminated after a life of twenty-five years, if the Black bill, passed by the House, becomes a law. In urging the passage of the bill, the plea was made that it is better than the Wise bill, which provides for the revocation of indeterminate franchises at will. The sponsors of the measure contend that it was introduced to permit interurban railways which are less than 10 miles long but connect two towns or cities to enter the cities. The revocation clause was put into the bill by amendment. The Senate committee on public utilities has reported the measure out for passage.

Three of the four bills necessary to the settlement of the Cincinnati traction question under Mayor Hunt's plans have been voted upon favorably by both houses of the Legislature and will undoubtedly be signed by Governor Cox. The fourth, which permits the surrender of the present franchise for one of indeterminate length, has been delayed by objections from Mayor Baker of Cleveland. Representative Bigelow's bill, intended to revoke all franchises having more than twenty-five years to run from the date of granting, is reposing in the Senate committee on municipal affairs, and it is thought that it will remain there.

PENNSYLVANIA

There are indications that the State Senate will manifest a better disposition to act promptly in the matter of the various measures pledged to the people in the Republican and Democratic State platforms which have been pigeonholed in committees for some weeks, now that the legislative committee of the Republican state convention has met and reminded the Senators of their pre-election pledges to their constituents. One of these platform measures, the public utilities bill, is still in committee, and a further public hearing is promised before the committee will report the bill to the House. Among the Senate bills passed recently by the House was the measure fixing a penalty for attempts at train wrecking. The bill regulating the location of trolley wire was recommitted to the public roads committee of the House. Senator Hoke has introduced a bill authorizing the State Highway Department to take over the rights of way of railroad and railway companies that have been abandoned or not built. Representative Shern of Philadelphia has introduced the Philadelphia subway bill in the House. He explained that the bill, which is to establish personal property as a basis on which to levy county taxes, as a revenue measure must originate in the House. He further explained that the bill applies alike to all counties of the Commonwealth. The bill providing for the establishment of public comfort stations in cities and boroughs of over 12,000 population has been passed by the House. It is expected that efforts will be made in a number of cities to secure the financial assistance of electric railways in erecting these stations.

ONTARIO

Adam Beck has introduced an act for the public construction and operation of electric railways that provides the machinery by which municipalities throughout the Province can secure transportation service for themselves. The bill provides that the Hydroelectric Power Commission, whenever required by the Lieutenant-Governor-in-Council so to do, may investigate and report upon the cost of constructing and operating electric railways in any locality where power is supplied by the commission, with an estimate of the probable revenue, etc. Two or more municipal corporations may be authorized by the Lieutenant-Governor-in-Council to enter into an agreement with the commission for the construction, equipment and operation of an electric railway, to be operated by power supplied by the commission, or for the construction of a line by the commission and for its operation by the corporation, or for its construction and operation by supply of power by the commission.

WISCONSIN

The Jennings bill regarding street railway service has been passed by the Assembly. Any company, according to the bill, which has been ordered by the Railroad Commission to put on extra cars and fails to do so within the time designated cannot enforce collection of fares from passengers who are not furnished with seats. The bill is not confined in its operation to any one class of cities, but applies to all parts of the State.

PROGRAMS OF ASSOCIATION MEETINGS

Keystone Railway Club

It has been decided to hold the next meeting of the Keystone Railway Club at the Colonial Hotel, York, Pa., on June 2 and 3, 1913, to avoid conflicting with the convention of the Master Car Builders Association. Suggestions for the question box are earnestly requested as it will be necessary to publish all questions not later than April 30.

Arkansas Association of Public Utility Operators

The following program of papers has been announced for the meeting of the Arkansas Association of Public Utility Operators which will convene at the Marion Hotel, Little Rock, on May 5, for a three-day session:

May 5

Paper, "Operation of Small Central Stations," by W. H. Walkup, superintendent and chief electrician of the Batesville Electric Light & Power Company, Batesville, Ark.

May 6

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

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

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

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

Paper, "Modern Practice on Feeder and Voltage Regulation," by V. A. Hain, district regulator specialist of the General Electric Company, Chicago.

May 7

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

Paper, "Electric Light Accounting Applied to Small Companies," by R. B. Fowles, auditor of the Pine Bluff (Ark.) Company.

Financial and Corporate

Stock and Money Markets

April 23, 1913.

Trading on the New York Stock Exchange to-day ceased entirely at times and the total sales for the day represented only a good half hour's business in times of active speculation. The sales to-day totaled 150,986 shares, as compared with 564,920 shares for the same day last year. The traction stocks, which have been neglected for some time, showed increased activity. Moderate gains were made in Interborough-Metropolitan preferred and in Brooklyn Rapid Transit. Rates in the money market to-day were: Call, 2¾ to 3 per cent, with the last loan at 2¾ per cent; sixty days, 4 to 4¼ per cent; eleven and twelve months, 5 per cent.

The Philadelphia market to-day was broad and steady. The demand for bonds was good.

The feature of the Boston market to-day was the activity in New Haven shares. The market was narrow but firm.

In the Chicago market to-day dealings were small and the movement was irregular and narrow. There was very little demand for bonds.

In Baltimore United Railways common again led the stock market, which was extremely narrow and dull.

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

	April 16.	April 23.
American Brake Shoe & Foundry (common)	92	92
American Brake Shoe & Foundry (preferred)	131	130½
American Cities Company (common)	40	37¾
American Cities Company (preferred)	70¼	70½
American Light & Traction Company (common)	380	365
American Light & Traction Company (preferred)	105	105
American Railways Company	38¾	38
Aurora, Elgin & Chicago Railroad (common)	42	42
Aurora, Elgin & Chicago Railroad (preferred)	85½	85
Boston Elevated Railway	98	96¾
Boston Suburban Electric Companies (common)	7½	7½
Boston Suburban Electric Companies (preferred)	a66	a66
Boston & Worcester Electric Companies (common)	a8	8
Boston & Worcester Electric Companies (preferred)	43	a43
Brooklyn Rapid Transit Company	90¼	90⅝
Capital Traction Company, Washington	123¾	122¾
Chicago City Railways	150	150
Chicago Elevated Railways (common)	29	25
Chicago Elevated Railways (preferred)	88	85
Chicago Railways, ptcptg., ctf. 1	90	91
Chicago Railways, ptcptg., ctf. 2	22	21¾
Chicago Railways, ptcptg., ctf. 3	7	7½
Chicago Railways, ptcptg., ctf. 4	3½	3½
Cincinnati Street Railway	111	112
Cleveland Railway	103	103
Cleveland, Southwestern & Columbus Ry. (common)	5½	*5½
Cleveland, Southwestern & Columbus Ry (preferred)	30	*30
Columbus Railway & Light Company	18	18
Columbus Railway (common)	69½	69½
Columbus Railway (preferred)	82½	82½
Denver & Northwestern Railway	*108	*108
Detroit United Railway	80	72½
General Electric Company	139⅞	140¼
Georgia Railway & Electric Company (common)	118	*120
Georgia Railway & Electric Company (preferred)	83¼	83¾
Interborough Metropolitan Company (common)	17	16⅝
Interborough Metropolitan Company (preferred)	58	57⅝
International Traction Company (common)	*35	*35
International Traction Company (preferred)	*95	*95
Kansas City Railway & Light Company (common)	15	15
Kansas City Railway & Light Company (preferred)	*30	*30
Lake Shore Electric Railway (common)	*6½	*6½
Lake Shore Electric Railway (1st preferred)	*91	*91
Lake Shore Electric Railway (2d preferred)	*25½	*25½
Manhattan Railway	128¾	128¾
Massachusetts Electric Companies (common)	17½	a17¾
Massachusetts Electric Companies (preferred)	76	75½
Milwaukee Electric Railway & Light Co. (preferred)	*100	*100
Norfolk Railway & Light Company	*25¾	*25¾
North American Company	76	76
Northern Ohio Light & Traction Company (common)	80	80
Northern Ohio Light & Traction Company (preferred)	105	105
Philadelphia Company, Pittsburgh (common)	44	44
Philadelphia Company, Pittsburgh (preferred)	40	39¾
Philadelphia Rapid Transit Company	25¼	25¼
Portland Railway, Light & Power Company	*67	*67
Public Service Corporation	115	113
Third Avenue Railway, New York	36	35
Toledo Railways & Light Company	a12½	a12
Twin City Rapid Transit Co., Minneapolis (common)	105	105
Union Traction Company of Indiana (common)	*4½	*4½
Union Traction Company of Indiana (1st preferred)	*81	*81
Union Traction Company of Indiana (2d preferred)	*34	*34
United Rys. & Electric Company (Baltimore)	25	26½
United Rys. Inv. Company (common)	27½	26½
United Rys. Inv. Company (preferred)	49	48
Virginia Railway & Power Company (common)	52	51¾
Virginia Railway & Power Company (preferred)	93	93
Washington Ry. & Electric Company (common)	91½	93
Washington Ry. & Electric Company (preferred)	91⅝	92½
West End Street Railway, Boston (common)	75½	75½
West End Street Railway, Boston (preferred)	95	a95
Westinghouse Elec. & Mfg. Company	63⅛	64⅛
Westinghouse Elec. & Mfg. Company (1st preferred)	116	117½

*Last sale. aAsked.

ANNUAL REPORTS

Chicago Railways Company

The income statement of the Chicago (Ill.) Railways shows the city's share of the net income to be $1,413,404 for the year ended Jan. 31, 1913, and the company's share to be $1,156,422. The comparative statement of income for the years ended Jan. 31, 1913 and 1912, follows:

JOINT ACCOUNT

	1913	1912
Income from:		
Passengers	$17,709,296	$16,737,407
Chartered cars	4,806	4,699
Mail	31,489	37,809
Advertising	100,000	100,000
Rent of equipment	12,545	14,054
Rent of land and buildings	8,024	15,205
Sale of power	60,413	120,090
Interest on deposits	61,361	51,737
Miscellaneous income	88,933	75,494
Gross income	$18,076,777	$17,156,495
Expenses:		
Maintenance way and structures	$738,174	$747,581
Maintenance equipment	682,862	868,279
Renewals	1,446,142	1,381,179
Operation of power plants	1,852,719	1,771,302
Operation of cars	4,881,644	4,643,183
General expenses	1,410,693	1,820,280
Investment real estate expense	39,309	25,908
Taxes	676,959	855,390
Total expense	$11,728,502	$12,113,102
Balance	$6,348,275	$5,043,393
Deduct interest at 5 per cent on valuation	3,778,449	3,549,018
Net income	$2,569,826	$1,494,375
Division of new income:		
City of Chicago, 55 per cent	$1,413,404	$821,906
Chicago Railways Company, 45 per cent	1,156,422	672,469

The income statement for the years ended Jan. 31, 1913 and 1912, for the non-partnership account, follows:

Items of income:	1913	1912
The company's proportion of income from joint operation	$1,156,422	$672,469
Interest allowance on valuation of property	3,778,449	3,549,018
Interest on bank balances	122,775	125,877
Interest on treasury securities	90,653	54,041
Interest on bonds and collateral notes not issued	.....	25,784
Miscellaneous income	840	2,457
Gross income	$5,149,139	$4,429,648
Deductions:		
Interest accrued on—		
First mortgage bonds	$2,297,750	$2,180,267
Consolidated mortgage bonds	1,817,919	1,218,792
Collateral and funding notes	24,900	396,900
Purchase money mortgage bonds	162,920	162,920
Current liabilities	.....	1,144
Sinking fund reserve accrued	250,000	250,000
Corporate expenses and adjustments	120,574	118,400
Total deductions	$4,674,063	$4,328,423
Net income	$475,076	$101,224

The surplus account for year ended Jan. 31, 1913, follows:

Surplus at first of year	$306,515
Net income for year	475,076
Total	$781,591
Deductions:	
Interest on adjustment income bonds for thirteen months ended Jan. 31, 1912 (net)	$103,079
Dividend on partnership certificate No. 1 and expenses	243,000
Total	$346,079
Balance of surplus at close of year	$435,511

Note.—Payable out of the surplus at Jan. 31, 1913, a dividend was declared on No. 1 partnership certificates, amounting with expenses to $209,800, and same was paid on Feb. 1. There has accrued, and same is payable May 1, 1913, interest on adjustment income bonds for the year ended Jan. 31, 1913, amounting to (net) $95,172.

Traffic statistics for the years ended Jan. 31, 1913 and 1912, follow:

Car mileage:	1913	1912
Passenger cars	59,276,772	57,208,131
Mail cars	188,575	196,074
Total	59,465,347	57,404,205
Passengers carried:		
Revenue	355,518,500	334,769,338
Transfer	256,408,891	239,589,482
Total	611,927,391	574,358,820
Percentage of operating expenses to gross income	53.14	57.56
Percentage of renewals to gross income	8.00	8.05
Percentage of taxes to gross income	3.74	4.99
	64.88	70.60
Percentage of interest on plant value to gross income	20.90	20.69
Percentage of net divisible income to gross income	14.22	8.71
	100.00	100.00

United Railways & Electric Company

The United Railways & Electric Company, Baltimore, Md., makes the following report of earnings and expenses for the fiscal year ended Dec. 31, 1912:

Gross earnings of lines (owned and leased)	$8,571,489
Operating expenses (including insurance)	3,868,876
Net earnings from operation	$4,702,613
Other income	5,515
Total net income applicable to fixed charges, taxes, etc.	$4,708,128
Fixed charges, including park and other taxes, bond interest, interest on car trust certificates and three-year notes, rentals for Maryland Electric Railways and other leased properties	2,944,415
	$1,763,713
Rental account, 1½ per cent sinking fund, Maryland Electric Railways 5 per cent bonds	60,000
	$1,703.713
Extinguishment of discount on securities	38,056
	$1,665,656
Interest on income bonds and dividend on preferred stock	560,000
	$1,105,656
Of which there has been credited to depreciation reserve fund	428,574
Balance carried to the credit of profit and loss	$677,082

Note.—There was paid in dividends during 1912 the sum of $463,050. The dividends, however, were not specifically declared out of 1912 earnings, and they were therefore charged to the profit and loss account.

William A. House, the president, says in part:

"Comparing the results for 1912 with those for 1911, the increase in gross earnings was $545,731, or 6.8 per cent, while the increase in operating expenses was $187,782, or 5.1 per cent, and the increase in fixed charges was $84,729, or 2.96 per cent. The percentage of operating expenses to gross earnings was 45.14 per cent, as compared with 45.87 per cent in 1911. If the charges to depreciation were included in the operating expenses, the percentage of operating expenses to gross earnings would have been 50.14 per cent. For maintenance of way, structures and equipment there was spent during the year $843,914 in addition to the $379,115 depreciation, or a total of $1,233,030.

"After deducting operating expenses, taxes, interest, rentals, depreciation, etc., $677,082 was left available for dividends. This is at the rate of 4½ per cent on the $15,000,000 of common stock outstanding on Jan. 1, 1912, which amount, however, increased during the year owing to the conversion of notes into common stock. The board of directors did not distribute this full amount to stockholders, but in furtherance of its conservative dividend policy declared in April, 1912, a dividend of 75 cents per share, the first dividend ever paid on the common stock, and in October another dividend of 75 cents per share.

"The company has no floating debt. As of Dec. 31 it had cash on hand amounting to $485,595. The company also had in its treasury $450,000 notes of the Baltimore, Sparrows Point & Chesapeake Railway and $100,000 of notes of the Baltimore, Halethorpe & Elkridge Railway, representing in part the construction cost of those properties. It also had unpledged $889,000 of its own first consolidated mortgage 4 per cent bonds.

"The total taxes and public charges in 1912 paid by the company were $992,396. This represents the total net earnings (after paying cost of operation only) of about one car in every five.

"In recognition of the loyal and efficient service of employees wages were increased April 11, 1912, to motormen, conductors and employees of several departments of the company.

"During the year the Central Railway mortgage, maturing July 1, 1912, was released. The first consolidated mortgage 4 per cent bonds of your company are now an absolute first lien upon 182 miles of the system.

"The average earnings per car mile were 29.08 cents, an increase of 1.11 cents, and the cost of service 13.13 cents, an increase of 0.30 cent. The number of car miles run was 29,472,537, an increase of 774,198 miles. The total number of revenue passengers carried was 172,233,341, an increase of 10,765,614. The number of transfers used was 69,344,828, an increase of 4,701,192, more than 40 per cent of the paying passengers having availed themselves of the transfer privilege. During the year there was charged to depreciation 5 per cent of the gross earnings, or $428,574, of which there was expended $379,115 for improvement to road, its equipment and property generally under the normal standard of efficiency, in contradistinction to ordinary maintenance and repairs, leaving a balance of $49,458 held as reserve for depreciation. Current assets as of Dec. 31, 1912, were $1,555,730 in excess of current liabilities; accounts payable were increased $8.397, and cash on hand increased $17,164.

"Under the arrangement with the Maryland Electric Railways there was expended during the year $8,448 out of Maryland Electric bond proceeds, leaving a balance of $105,828, which will practically be absorbed by payments for the Harford Road carhouse, now in course of erection. There was also expended, under the terms of the Maryland Electric Railways mortgage, $305,853 out of the special sinking fund for the purchase of cars, and for converters, transformers and switching gear for the Central and Northern substations.

"The total amount of taxes and public charges, including park tax, cost of paving streets, track changes necessitated by re-grading of streets and highways, sewerage commission work, widening of streets, etc., was $992,396, an increase of $164,014, or more than 11½ per cent of the gross revenue of your company and more than 21 per cent of the net receipts after paying costs of operation. The park tax for the year was $550,677, as against $515,741 in 1911, an increase of $34,935. The federal excise tax amounted to $15,719. The increase in fixed charges, amounting to $84,729, is due to increase in park tax, the additional obligations incurred for rentals on property leased from the Maryland Electric Railways and tax assessments.

"Under the terms of indenture dated July 15, 1911, your company issued $3,125,000 three-year secured convertible notes. Up to Dec. 31, 1912, the holders of $435,000 of these notes had exercised their right of conversion, and 17,400 shares of common stock (par $50) were issued in exchange.

"As part collateral for these notes, there was also deposited with the trustee $2,500,000 of first consolidated mortgage 4 per cent bonds. Under the provisions of the indenture this company had the right to withdraw and has withdrawn an amount of these bonds proportional to the notes converted. The first consolidated 4 per cent bonds so withdrawn aggregated $348,000. As the company already held free in its treasury $541,000 of first consolidated 4 per cent bonds, the amount now so held is $889,000.

"During the year tracks were reconstructed along thirty-four different stretches, aggregating 7.3 miles of single track. There was also constructed 0.3 mile of new track and 5.5 miles of track was removed. At 298 locations special work pieces were installed, among which are included the layouts for extending the St. Paul Street line to Light and Conway Streets. Considerable special work was built at the company's own shops during the past season. Five thousand six hundred and ten joints on 9-in. girder rail, equivalent to 25 miles of single track, were electrically welded. Forty-four thousand and sixty-three ties were installed on suburban lines.

"In view of the fact that the company's power requirements were to a large extent supplied from the Holtwood plant of the Pennsylvania Water & Power Company, very little work was necessary at the Pratt street power house. This station, however, as well as all its apparatus has been maintained in a high state of efficiency in order to be prepared for immediate service in the event of a serious interruption of hydro-energy. The boilers at this station are always kept ready for emergency service.

"During the year a section of the North Charles Street carhouse was reconstructed with reinforced concrete, to adapt it to the purposes of a trouble station. A 2-ton motor truck has been assigned to this station for use of the overhead line department. This new station replaces the former trouble station on Maryland Avenue, near North Avenue, which has been abandoned. Owing to the sale of the East Baltimore Street power house it became necessary to abandon this building for trouble station purposes. Property located at the southeast corner of Caroline Street and Fairmount Avenue was purchased and remodeled to adapt it to trouble station uses.

"A contract was awarded on Oct. 1 for the construction of a modern carhouse on the Hartford Road just beyond the city line and in close proximity to the new Herring

Run Park, recently acquired by the park board. The building will be ready for occupancy this spring, and with its completion your company will be provided with seven modern fireproof carhouses. A modern fireproof reinforced concrete oil house was erected at the Carroll Park shops.

"Recognizing the loyal and efficient service of its employees, your board of directors at a special meeting, held on April 10, authorized an increase in rates of pay to employees in the transportation, car shops, overhead line, power house and engineer departments. This increase became effective April 11.

"Sixty new double-truck semi-convertible cars were placed in service during the year on the Gay Street line. Five double-truck, semi-convertible cars were remodeled at the company's shops to the P-A-Y-E type, and added to the equipment of the Calvert Street line. The total number of P-A-Y-E cars now in operation on the company's system is 182."

Protest by New York Railways Against Commission Order Regarding Depreciation.

The New York (N. Y.) Railways has served upon the Public Service Commission for the First District a writ of certiorari, issued by Supreme Court Justice M. Warley Platzek, to review the action of the commission in requiring the company to set aside 20 per cent of its gross earnings each month for maintenance and depreciation. An account of the disagreement between the New York Railways and the Public Service Commission, First District, New York, in regard to the orders of the latter about amortization, maintenance and depreciation funds was published in the Electric Railway Journal for Dec. 14, 1912, page 1209. The original order of the Public Service Commission, First District, on this subject was issued Feb. 27, 1912, and required the New York Railways to establish an amortization fund to make up the alleged difference between the value of the property under its mortgages and the face value of the bonds, and before paying interest on its adjustment mortgage bonds or paying dividends on its stock to pay in cash into this fund each year $108,000, plus 4 per cent on all prior payments into the fund until the fund should amount to $16,500,000. This fund was to be used only for the purchase and retirement of mortgage bonds or for the acquisition of property for capital or investment purposes. At the same time the company was also ordered to set aside for maintenance and depreciation during each month a sum at least equal to 20 per cent of its gross operating revenue for that month, and if this amount was not expended for repairs and maintenance within that month the unexpended portion was to be credited as at the end of that month to the accounts "accrued amortization of capital," in accordance with the provision of the uniform system of accounts prescribed by the commission for street and electric railways.

As stated in the article in the issue of Dec. 14, the commission later modified its order so as to require only the payment of the 20 per cent for the maintenance and depreciation. It stated at that time that while it believed the company ought to provide an amortization fund for making up the difference which the commission claimed existed between the face of the securities and the value of the property, the public service laws were not broad enough to authorize the commission to issue an order requiring the company to do so.

The present petition of the New York Railways Company on which the writ of certiorari was issued says:

"Your petitioner further shows that said final or amended order adopted by the commission on Dec. 10, 1912, providing that your petitioner, New York Railways Company, before declaring or paying any dividend on its shares of stock or interest on its income bonds secured by said adjustment mortgage, should expend or set aside each month, beginning Jan. 1, 1912, for maintenance and depreciation a sum at least equal to 20 per cent of its gross operating revenue for such month, the unexpended portion thereof to be credited at the end of each month to the account known as 'accrued amortization of capital' in accordance with the provisions of the uniform system of accounts prescribed by the commission for street and electric railways, is unauthorized and illegal; that said commission had no statutory authority or power to make said order; that said commission had no jurisdiction of your petitioner, New York Railways Company, to make said order in the proceeding then pending entitled 'Case No. 1305, in the matter of the plan for the reorganization of the Metropolitan Street Railway Company'; that by said order the said commission has illegally and in violation of your petitioner's rights sought to substitute its judgment for the judgment of the board of directors of your petitioner in the management of its railroad, and more particularly in determining the proper amount to be expended or set aside each month for the maintenance and depreciation of its railroad properties; that by attempting to establish a fixed and arbitrary percentage of gross operating revenue to be expended or set aside for maintenance and depreciation the said order prevents your petitioner from complying with the obligation of its contract with its adjustment bondholders to pay and distribute as interest on said bonds the net income of the company, as defined and determined in accordance with the provisions of said adjustment mortgage, and that by adopting said order the said commission has illegally and unreasonably discriminated against your petitioner, New York Railways Company, in that a special and different rule in respect of maintenance and depreciation accounts is sought to be applied to it, which does not uniformly apply to all street railroad corporations subject to the supervision of the Public Service Commission for the First District or which does not uniformly apply to all the street surface railway corporations in the class to which your petitioner belongs, according to the classification heretofore adopted by said commission."

The petition further requests that the commissioners be directed to return all their proceedings, decisions and actions arising under these orders and the evidence and exhibits submitted to the commissioners upon which these orders were based with their determinations as commissioners, "to the end that the said proceedings, decisions and actions of the said commissioners in the premises may be vacated and set aside and adjudged null and void and that your petitioner may have such other and further relief as to the court may seem just."

Hearing on Toledo Injunction Case

The so-called Barton Smith faction of stockholders of the Toledo Railways & Light Company, Toledo, Ohio, requested Attorney General Hogan on April 17, 1913, to bring quo warranto proceedings to oust the Toledo Traction, Light & Power Company from doing business in Ohio. Mr. Hogan stated that unless extraordinary circumstances should develop he would not interfere in the case.

The petition upon which the temporary injunction was granted by Judge J. M. Killits in favor of the Toledo Traction Light & Power Company asserts that the combined holdings of Maurice Allen, Louis E. Beilstein, H. S. Swift, William R. Hodge, E. R. Effler, Conrad Weil, Frank Hafer, Jay K. Secor, Charles F. Meilink and William H. McClellan, Jr., defendants in the suit and directors and officers under the Smith election, do not amount to more than twenty shares and that their financial interest in the Toledo Railways & Light Company is not more than $60. It is contended that stock was assigned in some cases to make the men eligible as directors. In ousting the old officers and putting in new ones it is claimed that the Smith interests violated their agreement with the plaintiff.

The hearing on the injunction case was begun in Judge Killits' court on the afternoon of April 18, the answer of the defendants, with the exception of Mr. Smith and Mr. McClellan, having been filed earlier the same day. They deny that they are attempting to aid Barton Smith to collect any sum of money and claim the United States court does not have jurisdiction in the case. They also deny that the plaintiff is the owner of 117,447 shares of stock of the Toledo Railways & Light Company or any shares whatever in the company and they also deny that there was any arrangement made through which Maurice Allen was elected president and L. E. Beilstein general manager. At-

torney Barton Smith and William H. McClellan, Jr., will file separate answers dealing with their own particular cases.

A lengthy statement was submitted to Attorney General Hogan by the law firm of Smith & Baker on April 18. The weight of the argument is that neither the Toledo Traction, Light & Power Company nor the Doherty Operating Company is eligible to operate under the public service laws of Ohio.

Cost of Electric Properties to the New Haven Railroad

According to the testimony of David E. Brown, an examining accountant of the Interstate Commerce Commission, at a hearing before Commissioner Charles A. Prouty at Boston, Mass., on April 21, 1913, the capital stock of the New York, New Haven & Hartford Railroad system has increased from $80,000,000 in 1903 to $180,000,000 at the present time and the total liabilities in the same period have increased from $94,000,000 to $415,000,000. The road's operated mileage in 1903 was 2057 and in 1912 it was 2090. Of the mileage operated in 1903 the road owned only 438 miles, while to-day it owns 1236 miles. The additional mileage was acquired at an expenditure of about $40,000,000. Mr. Brown detailed the facts in connection with the acquisition by the New York, New Haven & Hartford Railroad of the Rhode Island Company, which operates the electric railways in Rhode Island. He said that the New Haven company's ownership of less than $10,000,000 of stock of the Rhode Island Company cost the railroad $24,000,000. The New York, Westchester & Boston Railway cost the New Haven company $33,000,000 in principal and interest, or about $1,500,000 a mile. Electric railways in Connecticut operated by the Connecticut Company, a New Haven company subsidiary, were purchased at the following prices per share, according to the witness: Fairhaven & Westville Railroad, par $25, sold to the New Haven company for $45; Hartford Street Railway, par $100, sold for $285; Montville Street Railway, par $100, sold for an average price of $115.31; Norwich Street Railway, par $100, sold for an average of $121; Suffield Street Railway, par $100, sold for $150; East Hartford & Glastonbury Street Railway, par $100, sold for $285.

Earnings of Georgia Companies for Year

A statement of the earnings of the electric railways in Georgia for the year ended Dec. 31, 1912, as contained in the report of the Georgia Railroad Commission, follows:

	Gross Earnings.	Operating Expenses.	Net Earnings.
Athens Ry. & Elec. Co.	$214,663	$71,589	$143,073
Atlanta Northern Ry. Co.	138,438	103,215	35,222
Augusta-Aiken Ry. & Elec. Cor.	483,838	219,446	264,391
Chattanooga Ry. & Light Co.	22,732	16,683	6,050
City & Suburban Ry., Brunswick	36,647	21,683	14,963
Clarkesville Ry.	1,400	1,734	†334
Columbus R. R.	310,158	310,458	99,699
Covington & Oxford St. Ry.	8,522	6,430	2,091
Fairburn & Atlanta Ry. & Elec. Co.	27,622	15,707	11,914
Gainesville Ry. & Power Co.	35,304	18,759	16,545
*Georgia Power Co.	20,938	4,396	16,541
*Georgia Ry. & Elec. Co.	880,651	399,304	481,347
*Georgia Ry. & Power Co.	3,686,604	1,563,853	2,122,751
Macon Ry. & Light Co.	554,742	361,880	192,861
Rome Ry. & Light Co.	190,779	107,792	82,986
Savannah Elec. Co.	747,058	512,218	234,840
Valdosta Street Ry. Co.	8,791	6,745	2,046

*Georgia Power Company and Georgia Railway & Electric Company operated from Jan. 1 to March 17, 1912, when they were merged with the Georgia Railway & Power Company, which commenced operation on March 18, 1912. †Deficit.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—Howard R. Taylor, Baltimore, Md., has been elected a director of the Birmingham, Ensley & Bessemer Railroad.

Cincinnati & Columbus Traction Company, Cincinnati, Ohio.—The Union Savings Bank & Trust Company, Cincinnati, was appointed receiver of the Cincinnati & Columbus Traction Company on April 12, 1913, under a bond of $25,000. This railway was incorporated in 1901 with an authorized capital stock of $2,500,000. In January, 1905, the Union Savings Bank & Trust Company, as trustee, purchased $600,000 of the railway's bonds, secured by a first mortgage on the entire property and franchises, and in July, 1907, the same bank, as trustee, purchased $250,000 of the bonds secured by a second mortgage on the property. With interest coming due within a short time on some of its obligations and other conditions unsatisfactory on account of damage by the flood, the directors of the railway felt that the court should take charge of the property.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—The Cleveland, Southwestern & Columbus Railway has applied to the Public Service Commission for permission to issue $5,103,000 of first mortgage bonds and $1,500,000 of first preferred stock, this stock to be exchanged for an equal amount of the present outstanding preferred stock. The securities which it is desired to issue are to be placed in accordance with the plan for refinancing the company referred to at length in the Electric Railway Journal of Dec. 14, 1912, page 1210.

Cleveland (Ohio) Interurban Railroad.—Following a public hearing at Columbus recently the Public Service Commission of Ohio decided to take under advisement the application of the Cleveland Interurban Railroad for permission to issue $300,000 of bonds and a like amount of stock.

Denver (Col.) City Tramway.—First improvement mortgage 5 per cent gold bonds of the Denver Tramway Power Company to the amount of $47,000, dated 1903, have been called for payment at 105 and interest on May 10, 1913, at the office of the International Trust Company, Denver, Col.

Evansville (Ind.) Railway.—The Evansville Railway has filed amended articles of incorporation increasing its capital stock from $1,000,000 to $2,000,000 to take over the holdings of the Evansville, Henderson & Owensboro Traction Company.

Geneva & Auburn Railway, Seneca Falls, N. Y.—The proposed financial plan of the protective committee of note holders of the Geneva & Auburn Railway as presented to the Public Service Commission of the Second District of New York involves the issue of $300,000 of common stock and the issuance at this time of $500,000 of 5 per cent bonds under a refunding mortgage, the amount of which is to be determined hereafter. These securities are to be taken in exchange at par by the owners of the outstanding securities of the company. The company has not paid any dividends on its bonds since 1910. Frederick B. Campbell, attorney, stated before the commission recently that the engineer's appraisal of the company's physical property totaled $609,000, while the report submitted by the commission's engineer valued the property at $575,000. Mr. Campbell stated that the company in the reorganization plan would be willing to accept $600,000 as the compromised value of such property. William W. Atwood, one of the receivers of the company, testified that the net earnings during 1912 totaled $36,000, but explained that these returns and those of preceding years were necessarily low because of the large expenditures from earnings made by the company for improvements. He stated that the company planned to lay heavier rails in Waterloo and Geneva, acquire new cars and build a 12-mile extension from its present terminal near Seneca Falls to Auburn, this construction to be accomplished by the building of a new bridge. Mr. Campbell asked the commission to advise the company whether it believed such construction should be handled by the company itself or by a separate corporation created for that purpose. The matter has been taken under advisement by the commission.

Hummelstown & Campbelltown Street Railway, Hershey, Pa.—The Hummelstown & Campbelltown Street Railway will be known in the future as the Hershey Transit Company. The line connects Hummelstown, Campbell, Palmyra and Lebanon. M. S. Hershey, Hershey, president.

Joplin & Pittsburg Railway, Pittsburg, Kan.—The Joplin & Pittsburg Railway has applied to the Public Service Commission of Missouri for authority to issue $1,050,000 of 6 per cent refunding bonds. The application has been taken under advisement by the commission.

Tampa (Fla.) Electric Company.—The property of the Tampa & Sulphur Springs Traction Company has been sold under foreclosure to the Tampa Electric Company for $221,635.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa.—A mortgage for $750,000 has been placed on the property of the Trenton, Bristol & Philadelphia Street

Railway, under which an issue of $406,000 of first mortgage 5 per cent bonds has been authorized to take up certain floating debt. The bonds are dated March 1, 1913, and are due March 1, 1943. The interest is payable in May and September.

United Railways & Electric Company, Baltimore, Md.—More than $1,050,000 of the United Railway & Electric Company's convertible notes have been exchanged for common stock. This leaves about $750,000 of the notes outstanding. The time for conversion expires Jan. 14, 1914.

Western Ohio Railway, Lima, Ohio.—The Western Ohio Railway has applied to the Public Service Commission for authority to issue $50,000 par value of second preferred stock. The proceeds of the issue are to reimburse the company for expenses incurred in making betterments and extensions to the property, which is situated in Auglaize and Allen Counties.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

Brazilian Traction, Light & Power Company, Ltd., Montreal, Can., quarterly, 1½ per cent.

Columbus (Ohio) Railway, quarterly, 1¼ per cent, preferred.

Easton (Pa.) Consolidated Electric Company, 2 per cent.

Railways Company General, New York, N. Y., quarterly, 1 per cent.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, quarterly, 1¼ per cent, preferred.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo.	Feb.	'13	$6,848	*$6,754	$94	$1,086	†$922
1 "	"	'12	6,883	*5,971	911	1,048	†137
12 "	"	'13	120,684	*91,968	28,717	12,629	16,088
12 "	"	'12	119,356	*90,687	28,667	12,797	15,870

BATON ROUGE (LA.) ELECTRIC COMPANY

1 mo.	Feb.	'13	$11,835	*$7,077	$4,757	$2,074	$2,683
1 "	"	'12	11,018	*5,959	5,059	1,729	3,330
12 "	"	'13	149,463	*91,182	58,280	21,116	37,163
12 "	"	'12	124,467	*76,106	48,361	20,732	27,629

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, C. B.

1 mo.	Feb.	'13	$26,141	*$17,005	$9,135	$6,071	$3,064
1 "	"	'12	23,693	*15,356	8,337	5,635	2,702
12 "	"	'13	366,132	*196,795	169,337	68,727	100,610
12 "	"	'12	340,049	*185,112	154,937	67,792	87,145

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

1 mo.	Feb.	'13	$81,277	$52,728	$28,549	$30,705	$2,154
1 "	"	'12	77,419	51,489	25,929	30,135	4,206
2 "	"	'13	172,820	112,006	60,813	61,647	834
2 "	"	'12	156,989	104,287	52,701	60,318	7,617

DALLAS (TEX.) ELECTRIC CORPORATION

1 mo.	Feb.	'13	$163,243	*$93,829	$69,414	$24,635	$44,779
1 "	"	'12	129,751	*82,315	47,436	24,019	23,417
12 "	"	'13	1,890,698	*1,124,160	766,538	295,094	470,644
12 "	"	'12	1,642,068	*1,104,925	534,142	247,135	290,007

EL PASO (TEX.) ELECTRIC COMPANY

1 mo.	Feb.	'13	$75,298	*$36,070	$39,228	$4,240	$34,988
1 "	"	'12	61,644	*32,257	29,387	7,128	22,259
12 "	"	'13	818,121	*440,254	377,967	61,589	316,278
12 "	"	'12	706,407	*406,521	299,886	82,066	217,820

GALVESTON-HOUSTON ELECTRIC COMPANY, HOUSTON, TEX.

1 mo.	Feb.	'13	$158,773	*$99,155	$59,618	$33,660	$25,959
1 "	"	'12	136,445	*88,256	48,089	34,702	13,487
12 "	"	'13	2,073,593	*1,207,868	865,725	404,255	461,470
12 "	"	'12	1,594,526	*995,503	599,023	260,353	338,670

HOUGHTON (MICH.) COUNTY TRACTION COMPANY

1 mo.	Feb.	'13	$22,111	*$16,520	$5,592	$5,689	†$97
1 "	"	'12	21,970	*14,384	7,586	5,227	2,359
12 "	"	'13	309,901	*174,303	135,599	68,220	67,379
12 "	"	'12	301,235	*178,386	122,848	62,670	60,178

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1 mo.	Mar.	'13	$2,009,443	$1,219,268	$790,175	$765,093	$25,082
1 "	"	'12	1,883,374	1,169,084	714,289	744,578	30,289
9 "	"	'13	17,712,793	10,638,715	7,074,078	6,862,519	211,559
9 "	"	'12	16,761,663	10,314,920	6,446,743	6,654,665	207,923

*Includes taxes. †Deficit.

Traffic and Transportation

Low Rates of Fare Versus Efficiency of Service

The following statement is made under the heading "Low Rates of Fare Versus Efficiency of Service," by William A. House, president of the United Railways & Electric Company, Baltimore, Md., in the pamphlet report of the company for the year ended Dec. 31, 1912, recently made public:

"In one of your company's previous reports attention was called to the rigidity of fares with relation to street railways. Throughout commercial centers efforts are constantly being made to produce the necessaries of life at a minimum expense, with a view to reducing the selling price. In many instances this represents a deterioration in quality, whereas in the case of an improvement in the quality of certain commodities an advance in the selling price usually follows to cover the cost of the better quality. It would hardly be expected that any manufacturer would strive for both ends at the same time; yet the average community, doubtless owing to the fact that it does not stop to consider, demands this performance from its street railway.

"Electric transportation has become one of the most important necessities of life, yet it is practically the only necessity which has not advanced in price. This situation cannot exist indefinitely. By a gradual improvement of rolling stock, by costly reconstruction of tracks, by long and patient experimenting with means of producing and distributing motive power, by careful drilling of employees in their duties, and by constant campaigning for the purpose of reducing accidents to a minimum and educating the public in the method of using street cars, passengers are to-day afforded better, quicker, safer and more comfortable service than ever before in the history of street railways. To furnish this superior quality of transportation, however, means a large increase in the cost price of every item chargeable to service. Viewed from the manufacturer's standpoint, the natural assumption would be that the selling price of a car ride should be increased. On the contrary, however, this selling price has actually been lowered. The purchasing power of a nickel has been steadily decreasing for a number of years. To-day it will not buy nearly so much as it did five, ten or fifteen years ago, with possibly one exception, and that is when invested in a car ride, and yet the fact that the high cost of living hits the railway as hard as the individual is apt to be overlooked.

"An electric railway like the United Railways & Electric Company is an extremely intricate and complicated proposition, involving many delicate adjustments of means to ends and calling for the most expert and specialized kind of knowledge of all the multitudinous facts and conditions involved in its operations.

"Your company does not wish to and will not take any step that will tend to impair the efficiency of its service. It feels that it has brought the car ride to the highest reasonable quality of service for the minimum reasonable selling price. The same service could not be produced at a marginally lower figure without turning narrow profits into serious losses. Were the question asked, 'What motive has prompted the company to increase the quality of its commodity and yet permit an actual lowering of the selling price?' the answer would be, 'The belief that it is good business policy to please the public to the fullest extent possible, the company realizing that its good will is a priceless asset, as well as the chief guaranty of success, and not a matter of sentiment.'

"It has been the aim of the company to give the public a square deal, and it has acted and is acting in the belief that as it deals by the public so will the public deal by it. The company asks in return the patronage of the public and at all times the willing co-operation of the people, in short, a welding of the two interdependent interests to maintain the highest standard of efficiency at a rate that will secure a fair return to those who have faith in the future of the property—those who in the past, owing to the constant improvements and evolutions in street railway equipment and methods, have paid for frequent and costly changes and seen millions of dollars go to the scrap heap and to the profit and loss account of experience."

Portland Without Power to Enforce Fare Reduction Ordinance

City Attorney Frank S. Grant of Portland, Ore., in a letter submitted for transmission to the City Council holds that the city of Portland is without power to enforce the Clyde ordinance reducing street railway fares during the morning and evening rush hours. His letter to the Council follows:

"You have pending before the Council an ordinance having for its purpose the reduction of street car fares, in that you desire to require that all street railway companies operating within the city of Portland sell tickets at a reduced rate. Since that ordinance was prepared, and since the resolution calling for a hearing before the Council was prepared, you are advised that Judge Bean, of the United States District Court for the district of Oregon, has rendered an opinion that, under the Malarkey bill, municipal corporations are without power to act in the matter of fixing or regulating rates where the company to be regulated has filed its tariff with the Railroad Commission. The Railroad Commission advises me that the Portland Railway, Light & Power Company and other companies have filed their tariff with it showing local passenger fares, and therefore Judge Bean's opinion will control.

"The only remedy the city of Portland now has is to say that the tariff now in existence is unreasonable, and in order to have that question determined the Council of the city of Portland will have to appeal to the Railroad Commission from the present rates. If the complaint is filed it will then be incumbent upon the Council to produce evidence to the effect that said tariff is unreasonable. Whether or not you are in a position to furnish this evidence is a question, of course, which you alone must determine. This letter is for your information, and it will be my duty to inform the Council of its legal rights in the premises in view of this decision, if any attempt is made to enact the ordinance."

Transfers to Promote Power Use.—The Lexington (Ky.) Utilities Company is advertising electrical appliances and various features of central-station service upon the back of transfers issued by the Kentucky Traction & Terminal Company, operating extensive interurban and local lines, of which the Lexington company is a subsidiary corporation.

Increase in Wages in Toledo.—The Toledo Railways & Light Company, Toledo, Ohio, has announced an increase in the wages of conductors, motormen, car washers, etc., of the city lines. The minimum wages of conductors and motormen, which apply to beginners, have been increased from 22 cents to 23 cents an hour and the maximum from 25 cents to 27 cents an hour. The increases in the other branches of work are in about the same proportion. The salaries of several inspectors and dispatchers have also been increased.

Hearing on Height of Step in New Jersey.—A further hearing was held before the Board of Public Utility Commissioners of New Jersey in Jersey City on April 18, 1913, in regard to the height of steps on the cars of the Public Service Railway. The petition to the commission for the reduction of the height of steps was filed by the New Jersey Federation of Women's Clubs and by individual women and their case was presented by A. T. Dear. L. H. Gilmore, of counsel for the Public Service Railway, cross-examined the witnesses. The hearing will be continued on May 2.

Freight Franchise Asked in Salt Lake City.—A petition has been filed with the City Commission by the Utah Light & Railway Company, Salt Lake City, Utah, asking for permission to carry mail, express and small freight over its lines in the city in cars built for that purpose. The company has a line to Holliday, one to Sandy, Midvale and Murray, and is building to Bountiful. The plan is to construct special cars for the express work. Some mail is carried now, but if it has specially prepared cars the company hopes to carry all the mail on these cars instead of on the passenger cars.

St. Louis Car Service Bill Reintroduced.—The bill, based on the recommendations of the St. Louis Public Service Commission, to require the United Railways of that city to provide additional equipment, which was thrice defeated in the Municipal Assembly, was reintroduced in the City Council on April 15, 1913. This makes the fourth time the measure has been before the Council in six weeks. The measure provides for the addition of 135 motor cars and 165 trailers, increased service, etc. Eight months' time is allowed the company in which to comply with the provisions of the measure.

New Fare-Collecting System in Muskogee.—The Muskogee (Okla.) Electric Traction Company carried a card 6½ in. wide by 13½ in. high in the Muskogee *Phoenix* recently announcing the installation on its cars on April 14, 1913, of the Rooke system of fare collection. The concluding paragraph of the advertisement follows: "This system is of obvious utility for prepayment cars. Thousands of these registers are in successful use by conservatively managed companies in many cities. Please have your nickels ready. Read the notice posted in our cars. The passenger tendering five cents will be handed a nickel in exchange, for insertion."

Fort Wayne Companies Praised.—The following quotation is from an editorial published recently in the Fort Wayne *Gazette:* "The people of Fort Wayne are a unit in giving credit to the Fort Wayne & Northern Indiana Traction Company and to the Indiana Lighting Company for their conduct during the flood. The traction company was able to furnish lights on the ornamental circuits, gave light at the bridges and gave liberally from its funds to the general relief association. Not in the least behind the Fort Wayne & Northern Indiana Traction Company was the Indiana Lighting Company, which established lights wherever possible and also contributed to the relief funds. Each company has quickly restored its service in the flooded districts and the example furnished by them is one that should be taken to heart by the city."

Brief Filed in New Jersey Fare Case.—In a brief filed with the Board of Public Utility Commissioners of New Jersey in answer to petitions by the city of Long Branch and the township of Eatontown for a fare reduction, the Monmouth County Electric Company argues that it would bankrupt the company to reduce the fare from Eatontown to Long Branch to 5 cents. The company says that the Eatontown-Long Branch route is run at a loss because the company was compelled to make a detour in building the road. The private right-of-way from the city limits to Second Avenue cost $40,000 and the overhead structure across the tracks of the New York & Long Branch Railroad cost $28.000. As a concession in connection with the charge of two fares between Eatontown and the shore and only one between Eatontown and Red Bank, the company suggests that five return-trip tickets be sold from any point in Eatontown to any point in Long Branch for 75 cents instead of $1.

The Twin Cities To-day.—The Twin City Rapid Transit Company, Minneapolis, Minn., of which A. W. Warnock is general passenger agent, has issued a very attractive folder, "The Twin Cities To-day." Minneapolis and St. Paul, the twin cities of Minnesota, have a population of more than 500.000. They are called the cities of "lakes, rivers and parks." Within the limits of St. Paul and Minneapolis there are fourteen lakes with a shore line of more than 28 miles, while within a radius of 25 miles of these cities there are 100 more lakes. In both cities there are 4875 acres of parks and parkways, 1618 acres of park lakes and 51 miles of boulevards and river drives which border both sides of the Mississippi River from Fort Snelling to Minneapolis. According to the last census reports the death rate in the twin cities is lower than that of any other large community in the United States. The folder is an extremely artistic one, illustrated with many halftone engravings and colored map plates. In the center of the folder there is a map which represents an area of 16 miles by 48 miles with a population of more than 600,000. This territory is served by 402 miles of electric railway and 22 miles of express boat routes owned and controlled by the Twin City Rapid Transit Company. "The Twin Cities To-day" contains the story of Lake Minnetonka and other historical and general information of much interest to local residents and indispensable to visitors to the twin cities and vicinity.

Personal Mention

Mr. P. C. Reinking has been appointed auditor of the Fort Wayne & Springfield Railway, with headquarters at Decatur, Ind., vice Mr. Edwin Fledderjohann, resigned.

Mr. F. W. Johnson, formerly assistant general claim agent of the Philadelphia (Pa.) Rapid Transit Company, has been appointed superintendent of surface lines of the company.

Mr. Albert Scheumann has been appointed general freight and passenger agent of the Fort Wayne & Springfield Railway, with headquarters at Decatur, Ind., vice Mr. Edwin Fledderjohann, resigned.

Mr. C. H. James has resigned as traveling passenger agent of the Central California Traction Company, Stockton, Cal., to become connected with the Oakland, Antioch & Eastern Railway, with headquarters in Oakland, Cal.

Mr. H. G. Tulley has been appointed superintendent of transportation of the Philadelphia (Pa.) Rapid Transit Company to succeed the late James Bricker. Mr. Tulley was formerly assistant superintendent of transportation of the company in charge of discipline.

Mr. T. C. McReynolds, secretary, treasurer and general manager of the Indiana Railways & Light Company, Kokomo, Ind., has been appointed by Governor Ralston of Indiana as a member of the Panama-Pacific Exposition Commission to succeed Mr. Thomas Taggart.

Mr. William R. Willcox, until recently chairman of the Public Service Commission for the First District of New York, has been elected a director of the Merchants' Association of New York, to succeed Representative Herman A. Metz, who resigned from the board upon his election to Congress.

Mr. F. B. Lasher, whose appointment as auditor of the New York State Railways and the Mohawk Valley Company was noted in the Electric Railway Journal of April 5, 1913, was on April 21, 1913, appointed general auditor of the Schenectady (N. Y.) Railway with headquarters at the Grand Central Terminal, New York City.

Mr. Albert Akers, Quincy, Ill., has been appointed general manager of the Chicago, Peoria & Quincy Traction Company, Quincy, Ill., to succeed Mr. W. E. Elliott, who is no longer connected with the company as an officer, director or stockholder. The Chapman Company, Chicago, Ill., is the general contractor for the construction of the company's proposed electric railway.

Mr. C. N. Duffy, vice-president of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been named by Mr. J. J. Stanley, president of the Cleveland (Ohio) Railway, to represent it on the board of arbitration of three members which is to consider the question of an increase in the operating and maintenance allowances of the Cleveland Railway under the Tayler franchise ordinance.

Mr. Charles H. Hubbell, formerly connected with various electric railways in Ohio, Indiana and Illinois and secretary and assistant treasurer of the Texas Power & Light Company since its organization, has resigned to accept the position of vice-president and treasurer of the Southern States Audit Corporation, Dallas, Tex. On severing his connection with the Texas Power & Light Company Mr. Hubbell was presented by the employees of the treasury department with a watch fob set with diamonds.

Capt. William B. Kelley, who has just completed ten years of service as night superintendent of the transportation department of the Metropolitan Street Railway, Kansas City, Mo., has been appointed general supervisor of the system. Captain Kelley is a native of West Virginia, and earned his title of captain in the Civil War, serving with distinction throughout that conflict on the staffs of Generals Sigel and Kelley, the latter his father. In the early days Captain Kelley's health became impaired and he journeyed West. Seeking outdoor work, he accepted a position in the train service of the Metropolitan Street Railway. His executive ability soon asserted itself, and he rose rapidly from one position of trust to another. In 1903 he was appointed night superintendent, which position he relinquishes to take up his new duties.

Mr. G. W. Esslinger, whose appointment as chief engineer of the Lackawanna & Wyoming Valley Power Company, Scranton, Pa., was noted in the Electric Railway Journal of April 12, 1913, began his electrical career in 1892 as superintendent of power and transmission for the Washtenaw Electric Company at Ypsilanti, Mich., in which capacity he served for six years, resigning in 1898 to accept a position as superintendent of electric lines with the Detroit, Ypsilanti & Ann Arbor Railway, operating between Detroit and Jackson, Mich. In 1902 Mr. Esslinger resigned from the last-named company to enter construction work with Westinghouse, Church, Kerr & Company on the Lackawanna & Wyoming Valley Railroad, Scranton, Pa. In 1903 he accepted the position of electric line foreman with the Lackawanna & Wyoming Valley Railroad, in which capacity he remained up to the time of his appointment as chief engineer of the Lackawanna & Wyoming Valley Power Company, which leases and operates the power station of the Lackawanna & Wyoming Valley Railroad and supplies that road with power.

Mr. Sam W. Greenland, whose appointment as general manager of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., was noted in the Electric Railway Journal of April 19, 1913, was formerly assistant general manager of the company. Before becoming connected with the Fort Wayne & Northern Indiana Traction Company Mr. Greenland was general manager and treasurer of the Columbus Railway, Light & Power Company, Columbus, Miss., which operates both the railway and the lighting service in that city. Prior to his connection with the Columbus Railway, Light & Power Company he was associated with Mr. Robert W. Watson, then of Harrisburg, now of New York City, who was formerly general manager of the Fort Wayne & Northern Indiana Traction Company, a place which he resigned some months ago. Mr. Greenland has had the title of assistant general manager of the Fort Wayne & Northern Indiana Traction Company since June, 1911. He was appointed to the company in May, 1911, as purchasing agent and retains that title in addition to general manager. The Fort Wayne & Northern Indiana Traction Company is one of the best known interurban properties in the Central West. It operates 220 miles of line, has more than 250 motor and other cars and furnishes power for lighting purposes.

S. W. Greenland

Mr. C. A. Coolidge has resigned as first vice-president and general manager of the Spokane & Inland Empire Railroad, as general manager of the United Railways, Portland, Ore., and as general manager of the Oregon Electric Railway, controlled by the Hill interests. During Mr. Coolidge's connection with the Oregon Electric Railway the line was extended from Salem to Eugene and a branch was built from Gray to Corvallis, and upon his recommendation the operating voltage was changed from 600 volts to 1200 volts and the transmission voltage from 33,000 volts to 60,000 volts. This work was all done without interruption to the service. Mr. Coolidge also supervised the installation of the extensive system of automatic block signals between Portland and Garden Home. This installation has attracted attention on account of the number of signals installed and their location. He also introduced with success methods of operation in connection with the line which are very different from the usual practice in the East. The Spokane & Inland Empire Railroad has been practically rehabilitated within the last two years under Mr. Coolidge's supervision and economies have been effected which have resulted in reducing the operation and maintenance expenses, especially those of the single-phase apparatus, so that the single-phase installation on the Spokane & Inland Empire Railroad is a commercial and engineering success. Before

becoming connected with the properties at Portland and Spokane Mr. Coolidge was for eight years general manager of the Astoria Electric Company's lighting plants and railway lines at Astoria, Ore. He became connected with the Oregon Electric Railway in 1907 and in July, 1910, was appointed general manager of the Oregon Electric Railway. In September, 1910, he was also appointed general manager of the United Railways, Portland, and in July, 1911, was, in addition, elected first vice-president and general manager of the Spokane & Inland Empire Railroad. Mr. Coolidge has been continuously in service for the last thirteen years and contemplates taking a vacation of several months before re-entering the public utility field.

Mr. Franklin T. Griffith, who has been elected vice-president of the Portland Railway, Light & Power Company, Portland, Ore., and will succeed Mr. B. S. Josselyn, resigned, as president of the company, was born in Minneapolis, Minn., on Feb. 6, 1870. With his parents he moved to Oakland, Cal., while still in his teens. Here he attended school and was graduated from the high school and later on from Oakland Academy. Shortly after becoming of age he became cashier of the Oregon Woolen Mills. He studied law at night and was admitted to the bar. He has served as legal counsel in one capacity or another for the Portland Railway, Light & Power Company for nineteen years, his service previous to the consolidation being with the Portland General Electric Company, which had its power house at Oregon City. Few men possess a broader acquaintance among Oregon men than Mr. Griffith, and his administration of the sixty-five-million-dollar property of which he is soon to be the head will without a doubt be successful. The Portland *Oregonian* of April 8, 1913, concluded an editorial on Mr. Griffith's election as follows: "Mr. Griffith has made an excellent record as a citizen, as a lawyer and as attorney for the Portland Railway, Light & Power Company. He has given diligent study to public service problems and he knows as well as anybody else the relations of a corporation to its patrons and its duty to serve them satisfactorily and equitably. He is yet a young man, energetic, conciliatory and capable; and it is the opinion of all that know him that he will measure up fully to the exacting requirements of his important position."

F. T. Griffith

OBITUARY

Thies Jacob Lefens, one of the directors of the South Side Elevated Railroad and of the Merchants' Loan & Trust Company, Chicago, Ill., died at his home in Chicago on April 15, 1913. He entered business in Chicago as a commission merchant and in 1878 he was made secretary of the Conrad Seipp Brewing Company, with which he continued until 1892, when the property was sold.

George P. Brophy, one of the organizers of the Ottawa (Ont.) Electric Railway and the Ottawa Electric Company, is dead. Mr. Brophy was born in Carrillon, Que., in 1848. When a young man he accepted a position with the Department of Public Works as a draftsman and assistant engineer in New Brunswick. After a year in that position he was appointed by the late Alexander Mackenzie as superintendent engineer of the Ottawa River Works, an office he held up to the time of his death. He was also a director of the Ottawa Gas Company and vice-president of the Ottawa Trust & Deposit Company.

Local electric service will be established on the main line of the Long Island Railroad between Jamaica and Long Island City as soon as the new station at Jamaica has been completed and service has been established on the Woodside cut-off and through the Steinway tunnel from New York at Van Alst Avenue, Long Island City.

Construction News

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

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

RECENT INCORPORATIONS

***Lomax Terminal Railroad, Nauvoo, Ill.**—Incorporated in Illinois to build an interurban railway from Nauvoo through Henderson and Hancock Counties to Stronghurst. Capital stock, $25,000. Incorporators and directors: William T. Love, J. F. Smith, C. H. Kisner, H. W. Beardsley and L. O. Beardsley, all of Lomax, Ill.

***Middleport & Northwestern Railway, Columbus, Ohio.**—Incorporated in Ohio to build an electric railway between Columbus and Marietta, via Meigs, Athens and Washington Counties. Incorporators: D. N. Postlewaite, Charles P. Outhwaite, Singleton P. Outhwaite, N. Bragunier and J. C. Nickert.

Fallon (Nev.) Electric Railroad.—Incorporated in Nevada to build an electric railway between Fallon and Stillwater. Capital stock, $300,000. Directors: C. A. Hascall, president; E. E. Winters, secretary; A. B. Merritt, C. E. Kent, W. H. Harmon, A. Barman and C. L. Weaver. [E. R. J., April 19, '13.]

Public Service Newark Terminal Railway, Newark, N. J.—Incorporated in New Jersey to further the plans of the Public Service Corporation with regard to its proposed terminal improvements for the Public Service Railway. Capital stock, $5,000,000. Incorporators: Thomas N. McCarter, Rumson; George J. Roberts, East Orange, and John J. Burleigh, Merchantville, all officers of the Public Service Corporation, Newark, N. J.

***Tri-County Power & Traction Company, Newark, N. J.**—Incorporated in New Jersey to operate electric railways and other public utilities. Capital stock, $150.000. Incorporators: George H. Williams, George G. Teller and Wilber F. Brown.

***Albemarle & Whitney Street Railroad, Albemarle, N. C.**—Chartered in North Carolina to build electric railways and operate public utilities within 50 miles of Albemarle. Capital stock authorized, $100,000. Incorporators: T. H. Vanderford, Salisbury; J. H. Moss and L. L. Cotton.

Beloit, Delavan & Clinton Railway, Beloit, Wis.—Application for a charter has been made by this company in Wisconsin to build an electric railway from Beloit to Delavan, via Turtle, Clinton, Darien and Delavan, a distance of 30 miles Capital stock, $50,000. Among the incorporators are: Charles F. Lathers, Joel B. Dow, H. A. Von Oven, William S. Perrigo, B. P. Eldred, W. B. Tyrrell and A. N. Bort, all of Beloit. [E. R. J., April 19, '13.]

FRANCHISES

Edmonton, Alta.—The Council has approved the plans of the Edmonton Interurban Railway to build 10 miles of additional track in Edmonton.

Pine Bluff, Ark.—The Pine Bluff Company has received a franchise from the Council to double-track Main Street from Tenth Avenue to Martin Avenue in Pine Bluff.

Corona, Cal.—Sealed bids will be received up to June 3, 1913, by the Board of Trustees for a franchise, applied for by the Pacific Electric Railway, to build an electric line in Corona.

Los Angeles, Cal.—The Los Angeles Railway has received two franchises from the Council for extensions of its Fifty-fourth Street line from Denker Avenue to the western city limits and for the Tenth Street line to a point near the western city limits of Los Angeles.

Oakland, Cal.—The San Francisco-Oakland Terminal Railways has received a franchise to lay a third track on Grove Street from Fortieth Street to the city limits and to construct a spur track in Twenty-sixth Street, Oakland.

Orange, Cal.—The Pacific Electric Railway has received a fifty-year franchise from the Board of Supervisors, Orance. The company has asked the Council for a franchise for a line from the southern section of Los Angeles through the eastern portion of the city.

Atlanta, Ga.—The Georgia Railway & Power Company has received a franchise from the County Commissioners for a line from Brady and Emmett Streets through the Miller Union stock yards to the Howell Mill road and out to the Collier road in Atlanta.

Bassett, Kan.—The Union Traction Company, Independence, has received a franchise from the Council in Bassett. The company has accepted the franchise granted by the Council in Iola.

Bangor, Maine.—The Bangor Railway & Electric Company has received a franchise from the Council to extend its line across the Bangor bridge to Brewer.

Abbeville, Miss.—The Southwestern Traction & Power Company, New Orleans, has received a twenty-five-year franchise from the Council in Abbeville. This company will build a line from New Iberia to Abbeville.

Newark, N. J.—The Public Service Railway, Newark, has submitted plans to the Board of Works for the improvement and extensions of its line in Newark. The plans include twenty-seven applications for franchises for new lines, extensions and connecting links. Most of the franchises desired are for the lines contemplated in connection with the new terminal building to be erected in Park Place.

Jamestown, N. Y.—The Jamestown Street Railway has received a fifty-year franchise from the Council to extend its lines in Jamestown.

Dayton, Ohio.—The City Railway will ask the Council for a franchise over Bank Street to Fifth Street in Dayton.

Portland, Ore.—The Portland Railway, Light & Power Company will ask the Council for a franchise for a cross-town line on East Twenty-eighth Street in Portland.

Saskatoon, Sask.—The City Council has awarded the contract to the Saskatoon & Sutherland Contracting Company, Saskatoon, to build the Eighth Street line in Saskatoon.

Chattanooga, Tenn.—This company has received a franchise to double-track and extend some of its lines in Chattanooga.

Houston, Tex.—The Houston Electric Company has received a franchise from the Council for a 2-mile line from the Fifth Ward to the Houston Harbor addition in Houston.

Salt Lake City, Utah.—The Salt Lake & Utah Railway has asked the county commissioners for a new franchise through Salt Lake County in place of the old franchise. [E. R. J., Jan. 11, '13.]

Richmond, Va.—The Board of Aldermen has concurred in the resolution adopted by the Common Council authorizing the advertisement for sale of the franchise west of the Boulevard, petitioned for by the Virginia Railway & Power Company, operating on Broad Street from Robinson to the corporate limits of Richmond, with a spur southward along West Street from Broad to Leonard, to Sheppard, and south on Sheppard to Cary. A franchise asked for by the Richmond & Henrico Railway north on Thirty-fifth Street from Marshall to Dickinson, and thence along Dickinson to Oakwood Cemetery, was also ordered advertised, as required by law.

Tacoma, Wash.—The City Council will soon consider the question of submitting a proposal to the Tacoma Railway, Light & Power Company to build an electric line over the Eleventh Street bridge and across the tide flats. This is the route of the proposed municipal line the bonds for which will be voted on May 10.

TRACK AND ROADWAY

Gadsden, Ala.—Plans are being considered to build an electric railway from Gadsden, Ala., to Rome, Ga., via Center and Cave Spring, Ala. It is said that financial backing has been secured and preliminary arrangements will soon be made. [E. R. J., Dec. 28, '12.]

British Columbia Electric Railway, Vancouver, B. C.—This company has agreed to extend its line from Earls Road, Westminster, to Joyce Road, Collingwood, at once, and eventually to Boundary Road, Central Park, if the municipality will agree to several conditions of the company.

Pacific Electric Railway, Los Angeles, Cal.—This company has placed in operation the 1½-mile extension from the northern terminus of the old Glendale-Verdugo Park branch of the Glendale-Eagle Rock electric line to Montrose.

Sacramento Valley West Side Electric Railway, Willows, Cal.—Announcement has been made by this company that $410,000 worth of stock has been sold and that it is planned to let the first contract for grading the railway in Solano County in May. C. L. Donohue, Willows, president. [E. R. J., Feb. 15, '13.]

Connecticut Company, New Haven, Conn.—The committee on railroads has sent a favorable report on the proposed amendments to this company's charter granting extensions in New Britain, Newington, Farmington and West Hartford. The company has received permission to extend its North Street line in Hartford to connect Newington, Elmwood and West Hartford with Hartford in a direct route.

Washington Railway & Electric Company, Washington, D. C.—The Congress Heights Citizens' Association will make a proposal for the extension of this company's line south along Nichols Avenue in Washington.

Macon Railway & Light Company, Macon, Ga.—This company expects to repave about 10 miles of track in Macon.

Valdosta (Ga.) Street Railway.—During the next few weeks this company will award contracts to build 2½ miles of new track in Valdosta.

Alton, Granite & St. Louis Traction Company, Alton, Ill.—Plans are being made by this company to extend its line from Alton to the site of the new State Hospital for the Insane and from there to Bethalto and Fosterburg.

Fox & Illinois Union Railway, Aurora, Ill.—Work has been begun by this company in Morris on the partially constructed 20-mile line between Yorkville and Morris. It is now expected that the rails will be laid and the wires strung within the next sixty days and the line placed in operation within the next three months. [E. R. J., Aug. 5, '11.]

Chicago & Joliet Electric Railway, Joliet, Ill.—Work has been begun by this company relaying new tracks in new concrete work along Eastern Avenue in Joliet.

Peoria & Galesburg Railway, Peoria, Ill.—Surveys are under way by this company on its 60-mile line between Peoria and Galesburg. S. T. Atwood, secretary. [E. R. J., Oct. 26, '12.]

Iowa Railway & Light Company, Cedar Rapids, Ia.—Work will be begun at once by this company relaying its line in Cedar Rapids with 80-lb. rails, and preparations are being made to build extensions of its lines. The company has placed an order for $40,000 worth of copper wire.

Davenport-Muscatine Railway, Davenport, Ia.—Work will be begun in the spring by this company on the extension to northwest Muscatine as far as Roscoe Avenue.

Keokuk (Ia.) Electric Company.—This company is rebuilding 3 miles of track with 60-lb. T-rails and 5½ miles of new overhead work.

Waterloo, Cedar Falls & Northern Railways, Waterloo, Ia.—Among the improvements planned by this company in the near future will be the laying of new rails on portions of its track still carrying the old rails, and also a new track for loop purposes in Cedar Falls.

Union Traction Company, Independence, Kan.—A $30,000 bonus to this company, insuring the immediate construction of a 22-mile extension of this railway to Nowata, Okla., passing through South Coffeyville, Elliott, Lenapah and Delaware and the Nowata County oil fields, was voted by the city of Coffeyville recently.

Manhattan City & Interurban Railway, Manhattan, Kan.—During the next six weeks this company will award contracts to build 12 miles of new track and new steel bridges.

Louisville & Interurban Railway, Louisville, Ky.—This company has been asked by the citizens of Milton and Bedford to build an extension of its present line terminating at Lagrange to Milton, directly across the Ohio River from Bedford, Ind.

Louisville (Ky.) Railway.—This company has been asked by the Shawnee Democratic Club, Louisville, to build an extension a distance of several miles west on Madison or Walnut Street to Shawnee Park, and also to consider the advisability of a line through Thirty-fourth Street connecting the outlying suburban precincts of Parkland and Portland.

New Orleans Railway & Light Company, New Orleans, La.—About 2 miles of new track will be built in New Orleans by this company during 1913.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—Work has been begun by this company rebuilding the line between North Chelmsford and Ayer. The company plans soon to join the tracks of the Fitchburg & Lowell line with the tracks of the Fitchburg & Leominster line at Ayer.

Springfield (Mass.) Street Railway.—This company will build about 5 miles of new track during the year.

Battle Creek, Cold Water & Southern Railway, Cold Water, Mich.—About 30 miles of new track will be built by this company during the year.

Michigan United Traction Company, Lansing, Mich.—Surveys will be begun at once by this company for the proposed double-track line between Lansing and East Lansing.

Meridian Light & Railway Company, Meridian, Miss.—This company has placed contracts to build about 3 miles of track in Meridian.

Metropolitan Street Railway, Kansas City, Mo.—This company is asked to consider plans to build a line from the Kansas side through the business section of Kansas City to the new Union Station.

Southwest Missouri Railroad, Webb City, Mo.—The work of changing the roadbed of this company's railway at Lakeside is well under way. A large amount of grading has been done and work has been begun erecting a series of concrete arches across Center Creek, and a series of seven arches each of 55 ft. span will extend across the creek bottom northeastward from the bridge.

Butte (Mont.) Electric Railway.—Plans are being made by this company to award at once the contract for grading the extension of its Bryn Mawr and Emmett Street line in Butte.

Cloudcroft-Pecos Valley Railway, Cloudcroft, N. M.—Right-of-way has been secured by this company between Cloudcroft and the Pecos Valley and plans are being made to begin soon the construction of the line. J. C. Jones, Cloudcroft, is interested. [E. R. J., Feb. 22, '13.]

United Traction Company, Albany, N. Y.—This company contemplates expending $600,000 during the next two years in the extension and betterment of its lines. Among the improvements will be a line on New Scotland Avenue and an extension of its Arbor Hill line in Albany.

Frontier Electric Railway, Niagara Falls, N. Y.—Announcement has been made by this company that work will be begun within the next three months on its line to connect Niagara Falls, Buffalo, Tonawanda and North Tonawanda. [E. R. J., Dec. 9, '11.]

New York State Railways, Rochester, N. Y.—Work has been begun by this company rebuilding 2½ miles of its Sodus Bay branch, Rochester lines.

Schenectady (N. Y.) Railway.—This company plans to spend about $350,000 for improvements of its lines in Schenectady. Among the improvements will be 12 miles of extensions.

Guelph (Ont.) Radial Railway.—This company expects to build 3000 ft. of permanent roadway with 80-lb. rails.

Bloomsburg, Millville & Northern Railway, Bloomsburg, Pa.—In the near future this company will award contracts to build 10 miles of new track. About 9 miles of new material will be required.

Chambersburg & Shippensburg Street Railway, Chambersburg, Pa.—This company will soon award contracts to build 9 miles of new track with T-rails.

West Side Electric Street Railway, Charleroi, Pa.—This company is now building its line from Charleroi to Ellsworth. About 3 miles of grading and track work has been completed between Bentleyville and Ellsworth, Pa.

Easton (Pa.) Transit Company.—During 1913 this company will rebuild 7 miles of old city track.

Pittsburgh, Steubenville & Wheeling Street Railway, Pittsburgh, Pa.—Announcement has been made by this company that plans are completed to begin the construction of its line within the next sixty days. A prospectus submitted by the company was approved some time ago by a New York construction company, which, it is said, approved the plans and stated that it would do the work. It is proposed that the line will enter Pittsburgh over the tracks of the Pittsburgh Railway Company's line, connecting in West Liberty about 4 miles from the business center of Pittsburgh.

Pottstown & Reading Street Railway, Pottstown, Pa.—During 1913 this company will build 5½ miles of new track from Pottstown to Spring City, via Sanatoga and Linfield.

South Bethlehem & Saucon Street Railway, South Bethlehem, Pa.—During the next few weeks this company will award contracts to build four double-end turnouts.

Erie & Central Pennsylvania Railway, Titusville, Pa.—This railway, which is controlled by the Titusville Electric Traction Company, states that it has placed a contract with the P. A. Velotta Construction Company, Cleveland, Ohio, for the construction of 17½ miles of track needed to complete the line between Titusville and Cambridge Springs, Crawford County, Pa. The construction company is to furnish all material and supplies except the structural iron for bridges and the necessary equipment. The latter two items are to be furnished by the railway. For these no contracts have been let.

Philadelphia & Western Railway, Upper Darby, Pa.—The surveys for the line between Valley Forge and Bridgeport are being made by the Phoenix, Valley Forge & Stratford Street Railway and not by the Philadelphia & Western Railway, as reported in the Electric Railway Journal for April 5. The new line expects to connect with the Philadelphia & Western Railway at Bridgeport.

Southern Traction Company, Dallas, Tex.—During March this company built three bridges and laid 20 miles of track on the section of its line between Dallas and Corsicana and 20 miles of track on its line between Waxahachie and Waco. The total of track under construction for this company at present is 125 miles.

Rio Grande Valley Traction Company, El Paso, Tex.—This company has completed 10½ miles of grading between El Paso and Ysleta and the remaining 3 miles will soon be completed. Overhead work has been begun and 100 tons of rails have been ordered. This 16-mile line will extend from El Paso down the Rio Grande Valley to Socorro and Ysleta. C. W. Kellogg, El Paso, general manager. [E. R. J., Jan. 18, '13.]

***Madisonville, Tex.**—W. H. Krehlman and associates are considering plans to build an electric railway from Paris to Houston, via Madisonville.

San Benito & Rio Grande Valley Interurban Railway, San Benito, Tex.—This company announces that it completed 1 mile of track between Mission and Monte Christo during March and 1 mile of grading on the Brown Loop, 20 miles of which is now under construction. A. Robertson, San Benito, president.

Ogden (Utah) Rapid Transit Company.—This company has been authorized to double-track its Washington Avenue line in Ogden between Thirteenth Street and Canyon Road at once.

Lynchburg Traction & Light Company, Lynchburg, Va.—Within the next few months this company expects to build 4 miles of track on Rivermont Avenue and other short lengths of track in Lynchburg.

Spokane & Inland Empire Railroad, Spokane, Wash.—This company has awarded a contract to the Guthrie-McDougal Company covering about 300,000 cu. yd. of bridge filling on its Inland division. This work is now under way and will be completed during the summer.

Appalachian Power Company, Bluefield, W. Va.—During the next three weeks this company will award contracts to reconstruct and pave between the tracks for a distance of 4500 ft.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—Plans are being made by this company to build a new carhouse at Seventh Street and Central Avenue in Los Angeles. The structure will be 70 ft. x 250 ft. and in three sections.

Macon Railway & Light Company, Macon, Ga.—This company is now completing its new carhouses and will remodel its present carhouse during the year.

Valdosta (Ga.) Street Railway.—During the next few weeks this company will award contracts to build new carhouses and repair shops in Valdosta.

Manhattan City & Interurban Railway, Manhattan, Kan.—During the next few weeks this company will award contracts to build a new carhouse in Manhattan.

Cumberland (Md.) Railway.—During the next few weeks this company will award contracts to build new paint and repair shops in Cumberland.

International Railway, Buffalo, N. Y.—This company expects to build a new carhouse west of Main Street in Niagara Falls.

South Bethlehem & Saucon Street Railway, South Bethlehem, Pa.—During the next ten weeks this company will award contracts to build a new repair shop.

Knoxville Railway & Light Company, Knoxville, Tenn.—Plans are being made by this company to remodel the auditorium building in Knoxville at a cost of $3,000 and make a loop for the cars to run through the building.

Eastern Texas Traction Company, Dallas, Tex.—This company has obtained an option on a building in Greenville and will convert it into an interurban station.

Pacific Northwest Traction Company, Bellingham, Wash.—Plans are being made by this company to begin the construction of a new passenger terminal station and train sheds on the southeast corner of Sixth Street and Olive Street, Seattle. The cost is estimated to be about $50,000.

Merrill Railway & Lighting Company, Merrill, Wis.—During the summer this company expects to build an addition to its carhouse in Merrill.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Vancouver, B. C.—Plans are being made by this company to build a new substation on Bodwell Road and Main Street in South Vancouver. The structure will be one story high, with a gallery for the switching apparatus, and of reinforced concrete construction. The equipment will comprise three motor-generator sets of 1000-kw capacity each and a transforming equipment of 7000-kw capacity.

Colorado Springs & Interurban Railway, Colorado Springs, Col.—This company has placed an order for a 120-kw booster set for its power house in Colorado Springs.

Wilmington, New Castle & Delaware City Railway, New Castle, Del.—During the next few weeks this company expects to purchase a rotary converter for charging its Edison storage battery cars.

Tampa (Fla.) Electric Company.—Work will be begun by this company within the next few days on the addition to its power house, which is to cost $400,000. The capacity of the plant will be doubled. As soon as the building is sufficiently near completion the machinery at the substation at Tampa and Cass Streets will be moved and the old building torn down to give place to a new office building for the company. One of the improvements necessary to the addition to the power plant will be the construction of a tunnel from the river 175 ft. back to condense the steam from the machinery. The tunnel will cost about $30,000.

Manhattan City & Interurban Railway, Manhattan, Kan.—During the next few weeks this company will award contracts to build a new substation in Manhattan.

Meridian Light & Railway Company, Meridian, Miss.—This company has purchased one 2000-kw turbine from the General Electric Company and 1500-hp Murphy stokers for its power house in Meridian.

Chambersburg & Shippensburg Street Railway, Chambersburg, Pa.—During the next few weeks this company will award contracts to build a new substation with a capacity of 300 kw at Chambersburg.

Manufactures and Supplies

ROLLING STOCK

Austin (Texas) Street Railway expects to purchase two closed cars.

Denver (Col.) City Tramway is building six motor cars and twenty-five trail cars in its own shops.

Macon Railway & Light Company, Macon, Ga., is figuring on six 40-ft. double-truck pay-as-you-enter cars.

Meridian Light & Railway Company, Meridian, Miss., has ordered four cars from the St. Louis Car Company.

Charlottesville & Albemarle Railway, Charlottesville, Va., expects to purchase six convertible single-truck cars.

Newbern-Ghent Street Railway, Newbern, N. C., has ordered one storage battery car from the Cincinnati Car Company.

West Side Electric Street Railway, Charleroi, Pa., is in the market for one broad-gage combination express and construction car.

Milledgeville (Ga.) Railway has ordered from The J. G. Brill Company one 18-ft. storage battery car mounted on a Brill special storage battery truck.

Shreveport (La.) Traction Company has ordered from the American Car Company three 28-ft. 10-in. closed car bodies mounted on Brill 39-E trucks.

Union Electric Company, Dubuque, Ia., has ordered from the American Car Company six closed pay-as-you-enter car bodies mounted on Brill 39-E trucks.

Chambersburg & Shippensburg Street Railway, Chambersburg, Pa., expects to purchase two new double-truck cars and several single-truck open and closed cars.

Columbus Railway & Light Company, Columbus, Ohio, has ordered from The J. G. Brill Company one 45-ft. 6-in. double-deck stepless car body mounted on Brill 62-E trucks.

Tri-City Railway, Davenport, Ia., has ordered from the St. Louis Car Company thirty 30-ft. double-truck pay-as-you-enter cars. Twenty of these cars will be used in Moline and Rock Island, Ill., and Davenport, Ia., and ten in Cedar Rapids, Ia.

TRADE NOTES

St. Louis Southern Railroad Supply Company, St. Louis, Mo., has increased its capital stock from $25,000 to $65,000.

Union Spring & Manufacturing Company, Pittsburgh, Pa., has removed its New York office from 50 Church Street to 149 Broadway, New York.

A. Eugene Michel and Staff, New York, N. Y., advertising engineers, have removed from 21 Park Row into larger offices, Rooms 1001-7 Woolworth Building.

Manhattan Electrical & Supply Company, New York, N. Y., has elected J. J. Gorman its president to succeed H. T. Johnson, deceased. B. H. Ellis, treasurer of the company, was also elected vice-president.

Henry Floy, New York, N. Y., consulting engineer, who specializes in the appraisal of public service properties, is traveling through most of the important cities of Italy and Austria inspecting electric railway operation, fare zones, etc., as well as construction.

Davis-Bournonville Company, New York, N. Y., has moved its general offices to the Hudson Terminal Building, 30 Church Street, New York. The Chicago sales office of the company has been moved from 515 Laflin Street to 202-206 Monadnock Block, Chicago.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., announces that the sale of its products will hereafter be in charge of the general manager, Andrew Thompson, with offices at Niagara Falls, N. Y. A. C. Hawley will represent the company in the Pittsburgh district, being located at the company's office in the Oliver Building, Pittsburgh.

Electric Railway Equipment Company, Cincinnati, Ohio, announces that owing to increased business it has been compelled to secure larger quarters for its New York office and that on and after May 1 the Eastern office will be located at the Hudson Terminal Building, 30 Church

Street, New York. J. G. Kipp will remain in charge of the New York office.

International Pay-As-You-Enter Tramcar Company, Ltd., London, Eng., announces that the Aberdeen Tramways will inaugurate prepayment service on April 28 with ten new cars of the double-deck type described and illustrated on page 385 of the Electric Railway Journal for March 1, 1913. These tramways were the first to adopt the prepayment idea in Europe, as a converted car has been in use at Aberdeen since December, 1912. The Pay-As-You-Enter Company also advises that a proposal to use prepayment cars is now before the tramways committee of St. Petersburg, Russia.

Clark Electric & Manufacturing Company, New York, N. Y., will furnish the splicing sleeves for use on the transmission lines in the Canal Zone, where, owing to the severe atmospheric conditions, the use of a soldered joint is practically out of the question. These splicing sleeves will be furnished for copper and copper-clad steel conductor. The conductivity of the joint where copper conductor is used is about 250 per cent that of the incased conductor, the strength of each joint being guaranteed to be more than that of the conductor. Other orders have recently been received from the India office, London, for shipment to India and from a large power development on the Pacific Coast, this latter shipment including tinned copper sleeves for steel ground lines.

Anger Manufacturing & Supply Company, Ltd., Preston, England, is the name of a company recently organized in England, with headquarters at Bank Chambers, Fishergate, Preston, to take over the manufacture and sale of the Anger automatic brake adjuster, described in the Electric Railway Journal for June 1, 1912. Arthur Foster is chairman of the new company and George Herman Anger is the managing director. This brake adjuster has been applied to more than forty railway systems in England, and the company has on its books orders for 100 adjusters for Birmingham and 100 for Sheffield as well as orders from other tramways. The agency for Belgium, Holland, Denmark, Germany, Italy, Austria and Russia has been taken by the Continental Railway & Tramway Company, Brussels, and The J. G. Brill Company, Paris, France, will manufacture the control or selling rights of the device in France, Spain and Algeria The Anger company reports that its first brake adjuster had not been touched in any way for adjustment after a period of nine month and ten days, and that the brake-shoes to which it had been applied had worn out evenly. During this time the car to which the adjuster was fitted had run 28,000 miles.

General Electric Company, Schenectady, N. Y., has received the following orders for railway motors: Butte (Mont.) Electric Railway, four GE-200 40-hp four-motor equipments and fourteen extra control equipments; Southern Pacific Company, New York, N. Y., fourteen Sprague-General Electric type M multiple-unit control equipments and fifty-six GE-207 145-hp, 600-1200-volt two-motor equipments; Portland (Ore.) Railway, Light & Power Company, six GE-210 70-hp four-motor equipments; Public Service Railway, Newark, N. J., seven K-35-G controllers and forty-four complete air-brake equipments with CP-27 compressors; Schenectady (N. Y.) Railway, six GE-203 50-hp four-motor equipments and six straight-air-brake equipments; Iowa Railway & Light Company, Cedar Rapids, Ia., three Sprague-General Electric type M multiple-unit control equipments; North Carolina Public Service Company, Greensboro, N. C., two GE-216 50-hp two-motor equipments; Paducah (Ky.) Traction Company, four GE-80 40-hp two-motor equipments; Ohio Valley Electric Railway, Huntington, W. Va., nineteen GE-201 55-hp four-motor equipments; Southwest Missouri Railroad, Webb City, Mo., eighteen GE-203 50-hp motors; Benton Harbor & St. Joe Railway & Light Company, Benton Harbor, Mich., twelve GE-57 50-hp motors.

Johnson Fare Box Company, New York, N. Y., has just published in pamphlet form an interesting analysis of the receipts by quarters of the Third Avenue Railway from July, 1909, to June, 1912, which tends to show the effect of the use of fare boxes and of registering fare boxes on that system. It is difficult, of course, to determine exactly the effect, owing to the normal increase in traffic and other elements which may influence the result. Nevertheless, the pamphlet, which is entitled "Documents in Evidence," presents some very striking figures. Thus on the Third Avenue division of the railway the complete installation of P.A.Y.E. cars, equipped with non-registering fare boxes, was followed by an increase in the gross receipts of from 9.1 to 10.8 per cent during three quarters, as compared with the corresponding quarters in the previous year. Subsequent quarters showed an increase of only between 1.5 and 2.5 per cent over the corresponding quarters in the previous year until the Johnson fare boxes were installed, when the figures ran up to from 3.9 per cent to 8.4 per cent. During the next year the increase for the first quarter dropped to 1.4 per cent, which the Johnson company believes to be about the normal yearly increase due to traffic. This assumption is strengthened by the fact that this was about the increase during all these years on the Metropolitan system. The figures employed in the analysis are those of the Public Service Commission, New York, and they were compiled by an experienced street railway accountant connected with one of the largest street railway systems.

ADVERTISING LITERATURE

Sangamo Electric Company, Springfield, Ill., has issued Bulletin No. 35, in which Sangamo type D and type D4 direct-current watt-hour meters are described and illustrated.

Cook Railway Signal Company, Denver, Col., has printed a booklet which illustrates the various types of "ReVivo" dry storage batteries made by the company. These batteries are adapted for all purposes.

Pittsburgh Insulating Company, Pittsburgh, Pa., has issued a folder on Pico refined linseed oil which is used in the company's paints. A small piece of cloth coated with this oil is attached to the folder.

Standard Underground Cable Company, Pittsburgh, Pa., has issued a new price list on Sterling new code rubber insulated wire. Appended are explanatory notes and a list of electric wires and cables and cable accessories manufactured by the company.

Railway Improvement Company, New York, N. Y., has issued a twenty-page catalog entitled "The Car Beautiful." The catalog illustrates the various types of Rico sanitary strap covers, the stirrup strap and the "Steelkar" strap. Numerous illustrations are presented showing a few of the many types of cars in which Rico straps have been installed.

Lawrence & Wiggin, Boston, Mass., are distributing a statement regarding the lumber market, in which they set forth that they handle nearly 90 per cent of the long-ash lumber sold in the United States. This firm's St. Louis yards now hold a stock of 200,000 ft. of long ash. Attention is called by them to the fact that they are in a position to make immediate shipments to those roads which have recently suffered losses to their rolling stock and need material for making quick repairs.

J. G. White & Company, Inc., New York, N. Y., have reprinted in attractive pamphlet form the address "The Relation Between Capital and Rates," delivered at the University Club, New York, on March 7, 1912, by Frederick Strauss, of J. & N. Seligman & Company, on the occasion of the dinner tendered by J. G. White to the members of the J. G. White Club. Mr. Strauss is a director of J. G. White & Company, Inc., and was a member of the railroad securities commission appointed by President Taft.

Union Switch & Signal Company, Swissvale, Pa., has issued Bulletin No. 63, which describes the Hill automatic train stop. The following are some of the most important and interesting features of this device: The valve on the engine is protected by guards against false operation due to contact with obstructions other than the roadway trip designed for the purpose. The tripper itself is so designed that one of its parts must first be struck by one of the guards on the engine in order to bring the proper projection into operating contact with the engine valve. The engine valve needs only a slight impulse to cause it to act, as the operation is accomplished indirectly through a pilot valve, the plunger of which is struck by the trip.