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

Excursion Tickets as Newspaper Premiums

The plan tried last September by the Aurora, Elgin & Chicago, in connection with one of the large newspapers in Chicago, of selling excursion tickets at greatly reduced rates as circulation premiums is certainly a novel one, and the results seem to have justified the railway company in entering into such an arrangement for the time it was in force. Elsewhere in this issue the details of the scheme are described fully. The object of the railway

company was three-fold. First, to obtain the immediate revenue, amounting to \$12,500, and, second, to receive the benefit of a large amount of free newspaper advertising, and, third, to attract possibly regular patrons through a trial trip over the line. Handling 50,000 excursionists in five weeks, which was the period allowed, is a difficult task under any circumstances, but the arrangements for issuing the tickets and the limitations placed upon their use were so carefully planned that the traffic was distributed among certain trains on certain days and arrangements were made to know accurately beforehand the number of tickets issued for each train. So successfully were all the details of this large undertaking carried out that all of the 50,000 ticket-holders were enthusiastic over the service given and the attractions which they saw and enjoyed and thus became good advertisers of the railway. The regular traffic of the railway company was not interfered with to any appreciable extent during the period of the excursion, but, on the other hand, a large amount of dead car mileage was eliminated by utilizing the equipment necessary to handle the heavy inbound morning traffic for the outbound excursion traffic, and the reverse in the evening. The railway company considers the results as of great value, and there seems to be no reason why a similar experiment could not be tried with success by other interurban roads entering large cities.

Ventilation

According to the poets, the autumn days are the saddest of the year, and many passengers who are now forced to ride in stuffy cars, with the ventilators closed, have no difficulty in appreciating the force of this sentiment. In the winter the change from the outside temperature to a warm car tends to distract the attention of the average car rider from the lack of oxygen in the air. Again, in the spring the street railway patron has been reduced to such an abject condition and has become so habituated to impure air through months of riding in closed cars that he does not fully realize how vitiated is the air which he is breathing. But in the autumn the change from the open car, or from the semi-convertible type, with all the windows open, to the closed car, is very oppressive to the average individual. The first touch of frost seems to be the signal on many roads for battening down the hatches, to use a nautical expression, and for the establishment of a period of semi-asphyxiation until spring again calls the open car from its retreat or induces the more courageous passengers to drop the sashes.

For this condition the railway companies are not to blame. It seems to be a peculiarity of human nature that in matters of heat and fresh air the wishes of the minority govern. A single passenger who thinks he feels a draft

of fresh air from an open ventilator or window will put to discomfort every other passenger in the car, and they acquiesce without audible complaint. A few may secure refuge on the rear platform, but most accept the inevitable which they foresee will be their lot during the coming six months. Only rarely will one be found so courageous as to open the ventilators or ask the conductor to do so.

At first thought, a moving vehicle seems the most easy kind of a structure to ventilate. Practically, it is one of the most difficult, whether the vehicle is a Pullman car, a street car or a closed carriage. Movement through the air creates objectionable drafts, which are dreaded by many persons. The situation is complicated to some extent by the question of heating, upon which there are almost as many diverse opinions as upon the proper content of oxygen in the air. But the number of passengers who no longer consider it necessary always to have a street car kept at summer temperature is increasing. These people recognize the fact that in cold weather they are provided with wraps which they wear in the car, and that the usual condition of too high a temperature is quite as uncomfortable and as conducive to colds as a temperature which is too low. The problem of proper ventilation is not insurmountable, and is one to which it is appropriate at the present time to call attention. If inventors will devote their energies to the subject, it will afford a fruitful field for their talents, and we believe the average passenger will appreciate their efforts. In the meantime amelioration of present conditions can be made if two postulates are accepted as correct—that more fresh air will be acceptable to the majority of passengers in the interior of cars during the next six months and that less artificial heat can be supplied to advantage in most cases.

The Recipe for Success

An interesting paper upon the elements whose proper combination constitute the successful railway official was presented at the last meeting of the New York Railroad Club by W. J. Harahan. The subject is not new, but is one which is always interesting. No set formula can be written or expressed for the successful operating official. In one sense, he is born, not made. Some seem naturally endowed with ability to command and to direct large affairs. But there is no reason why the railway industry should form any exception to the rule that he who continuously puts all his energies into a work for which he is naturally fitted is often apt to outstrip in the race one who may be naturally more brilliant, but who is less thoroughly industrious and earnest. It is also true that many, if not all, of the qualities which go to make success in railway administration can be cultivated by one who has the requisite training, combined with a natural aptitude for the service.

Among the elements which might be classified as moral or social in their character mentioned by Mr. Harahan as necessary in the successful railway official were: honesty, loyalty, ability to harmonize, industry, thoroughness, love of the work, common sense, originality, self-confidence, business intelligence, and a capacity and disposition to treat the public fairly and courteously. Among those qualities which could be considered of a more technical

character were: ability to systematize and organize, the proper treatment of subordinates, experience, and an acquaintance with the latest developments of the industry in which he is engaged—the latter to be acquired through personal observation and a careful reading of the literature of his profession. Nor should he, for his own interest, confine these observations and studies within too narrow boundaries. To quote from the paper: "Without being an officious busybody, it should be the aim of the railroad officer to acquaint himself with the duties of other higher positions and even conditions in other departments besides his own. He should feel that some day he will be called upon to exercise those duties, at which time he should at least have an elementary knowledge of them." Surely this is advice worthy to have been given by Polonius to his son. Mr. Harahan could have added with perfect propriety that knowledge of such other departmental methods cannot but prove beneficial in the official's own work. The property as a whole is an entity, and if all of its affairs could be conducted by one man, with sufficient time for the entire management, the ideal system of direction would be reached. As this plan is not physically possible, the work must be divided among departments and department heads, but the object of all is the welfare of the company, and the better each understands the needs of all the others and conforms his actions to supply these needs, the more easily and effectively will the whole work be performed.

No attempt will be made to review in these columns all of the points mentioned in the paper under consideration, but one more remark made by the author can well be given attention here. This relates to the development in the man in charge of each department, as well as in his subordinates, of the "business sense"; that is, that each will carry uppermost in his mind the fact that the company was primarily organized to make a profit. The efforts of all should be directed to the ultimate attainment of that end. The cultivation of this spirit may best be secured, according to the author, by requiring "on the part of the officers an intimate knowledge of the proper costs of the performance of service and a comprehensive planning of the future expenses * * * and the railroad's policy of expenditures. Comparisons with last year are not conclusive; in fact, are misleading, unless the same conditions obtain in both years. The basis should be, therefore, cost of service, based on units of service to be performed." This is possibly even more true on an electric railway than on a steam railroad, because of the diversity of the work on the electric road. A great step in advance is gained when each department can establish such units of work and strive each year and each month to render more efficient service when gaged by them. With the power station such a convenient basis is easily supplied by the kilowatt-hour. In most other branches an equally satisfactory criterion of operating economy is not so readily available. Nevertheless, standards can be established for nearly every class of electric railway expenditure, if sufficient thought be given to their determination, and if each department is kept to a strict accountability based upon these standards, the end will usually be found to justify the trouble taken to obtain the means.

The Dual Failure at Cleveland

Failure of a spectacular nature was inevitable at Cleveland. If public temper had not been aroused, the failure might have taken the form simply of abandonment by the Municipal Traction Company of the 3-cent fare arrangement and the establishment of a more remunerative rate; but the strange, whimsical public on which Mayor Johnson had played so long became aroused, and voted at the referendum against the franchise, thus ending the necessity for the existence of the Municipal company and forcing it into bankruptcy. The dual failure in Cleveland is therefore irrevocable; The 3-cent fares have been proved unprofitable, and the lease of the property has, to all intents and purposes, been terminated.

The decision of Judge Tayler, of the United States Circuit Court of Cleveland, announcing that receivers would be appointed for the Municipal Traction Company appears to have left open for future determination some of the principal points in controversy, but it is strong and unequivocal in its characterization of certain fundamental faults in the street railway situation in that city. It showed that a heavy loss had resulted from operation of the lines by the Municipal Traction Company, that this corporation was financially irresponsible, and that it was wrongfully withholding control of the property from the real owner.

Control of the property of the Cleveland Railway Company was secured by the Municipal Traction Company under a lease dated April 27, 1908. As the receivers were appointed on Nov. 12, 1908, the operation of the lines by the new company lasted six months and a half. So far as the monthly statements of earnings have been made public, they indicated that up to Oct. 1 the net deficit after payment of operating expenses, taxes, interest and rentals was \$43,035. These figures, however, were based on the bare reports given out to the public by the officials of the Municipal Traction Company, and they permitted no analysis to disclose whether the accounts were conducted in accordance with the provisions of the lease.

All calculations respecting the extent of the true loss must be swept aside, because, until the facts are revealed by examination, the accuracy of the accounts pointing to this moderate deficit remains open to doubt. The court recognizes in its decision that the company had manifestly earned "no appreciable amount" above interest and rentals, and says "it is quite apparent that the necessities of the situation are such that it has in these six months sustained a heavy loss." It is clear that the court was not speaking of the deficit of \$43,000, but of an accumulated liability much greater in extent. Without reference to the figures purporting to give the operating results, it follows that if the property was not maintained in accordance with the lease and the reserves prescribed therein were not set aside, the real deficit was much larger than the returns showed. Judge Tayler states that "only a most careful inquiry into the character of the betterments claimed to have been made and into the large number of accounts of the lessee would justify even an approximate estimate of the extent of this loss."

Since it is evident that a large loss has occurred, though its extent is still to be ascertained, it is also apparent that the loss must have been sustained by some interest.

Upon no one does the loss fall more heavily than upon the long-abused owners of the Cleveland Railway; the Municipal company never had over \$1,000 capital paid in on its stock, and though in fairness it should have borne the expense of the experiment that time has shown was costly, it remained till the end, as it was in the beginning, "financially irresponsible."

Every stratagem that the skill of the attorneys could conceive was advanced at the last moment to support the claimed solvency of the Municipal Traction Company. Its most valuable asset was the lease, the attorneys held; but as the franchise had failed, the annulment of the lease followed. The solvency of the company rested, among various things, on the expenditures for betterments; but it could not secure reimbursement for these without disposing of Cleveland Railway stock at par, which was impossible because of market conditions. After all the arguments had been heard, the court held that the credits claimed by the Municipal company belonged, in the last analysis, to the Cleveland Railway; and if there should be charged against these the manifest liabilities of the Municipal company, it had "no assets at all, or none of any significance."

A clause in the lease provided that the Cleveland Railway Company should have the right and privilege, by such agent or accountant as it might designate, of examining and auditing at all reasonable times the payments, accounts, vouchers, records and other papers of the Municipal Traction Company, and that the latter was to afford the railway company every reasonable facility for such examination and audit.

It appears from the decision of the court that the Municipal company did not comply with this clause in the lease. The court admits that the Municipal company refused to comply with the request of the Cleveland Railway Company for duplicate vouchers and journal entries referring to payments under Section 6 of Article 3 of the lease, and states that this refusal makes necessary an examination of every item affected. This fund was equivalent substantially to a trust fund. The sum of \$293,050 was "deposited" with the traction company by the railway company "for the purpose of paying debts, obligations and liabilities incurred, contracted or sustained by the railway company" prior to Jan. 1, 1908, and not specifically listed in a schedule that accompanied the lease, "including expenses and attorney's fees incident to the adjustment and litigation thereof; and also for the purpose of paying such expenditures and disbursements as may have been made for such debts, obligations and liabilities as shall have been contracted, incurred or sustained" since Dec. 31, 1907. It was further provided "that the traction company will not pay from or charge against said fund any claims, debts, obligations or expenses unless the same and the amount thereof are approved by the railway company," except when final judgment is rendered on any claim.

Lessons for the companies as well as the public lie in the failure of the Cleveland experiment. The companies should try earnestly to show the exact cost of operation; the public should learn that it can never expect to receive 5-cent service, which it wants, for 3-cent fares.

WASHINGTON STREET SUBWAY

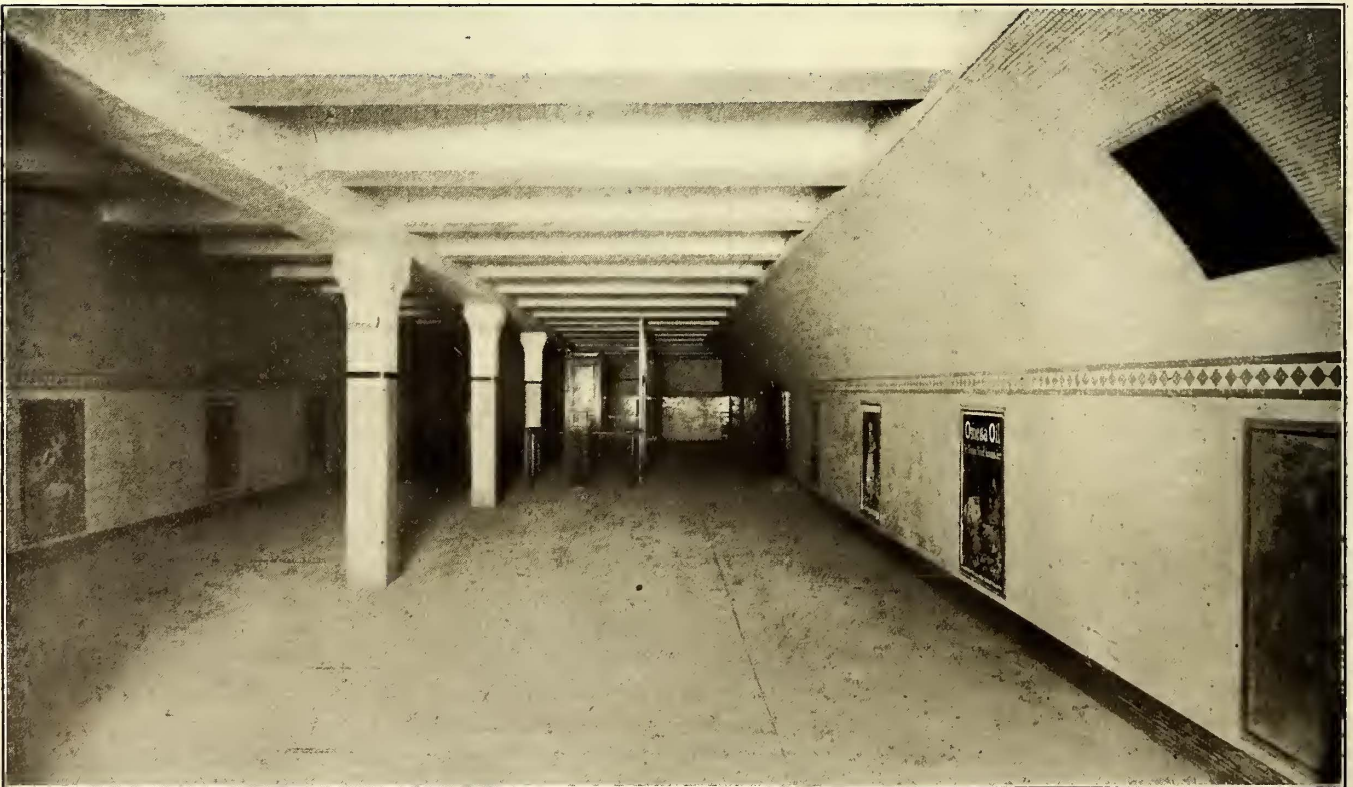
The Washington Street Subway, built by the Boston Transit Commission and leased to the Boston Elevated Railway Company for 25 years, is practically completed, and will be open for operation before the end of the year. This new tunnel runs under the heart of the business



Washington Street Subway—Typical Double-Track Section

district of Boston, and is a trifle more than a mile in length. To be exact, it is 5676 ft. long between portals.

The Tremont Street Subway in Boston was the first rapid transit tunnel built in the United States. Its equipment was considered at the time as nearly perfect as it could be made. Some improvements in design and finish of stations were incorporated in the New York subway, which was built some years later. The station walls were elaborately finished in decorated tiles and ornaments in relief. On the latest extension of the New York subway to Flatbush Avenue, Brooklyn, the designs of the walls have been carried to the other extreme. Only glazed white tiles are used, and the walls are very plain. The stations on the Sixth Avenue extension of the Hudson Tunnels in New York have vaulted masonry ceilings and are carefully designed and are handsome rooms, but they have the appearance of being low and cramped. In Philadelphia the subway stations are simple in design and finish, but are excellently lighted. The walls are lined with vitrified tile mosaic. In the construction of each of these subways the designers have profited by the experience of the earlier designs. The Washington Street tunnel in Boston, which is the most recent rapid transit subway, is thought to be the most elaborate in its finish and appointments of any. All steel construction throughout the tunnel has been protected from rust and fire by concrete. All of the woodwork is encased in sheet bronze, and the telephone booths, package rooms and electricians' closets are built with tiled masonry walls. All destination and direction signs are made of enameled metal. While the structure was designed by the Boston Transit Commission, the services of the board of advisory architects of the Boston Elevated Railway Company were at the disposal of the commission, and many of the details of the finish and



Washington Street Subway—Lagrange Street Lobby of Boylston Street Station

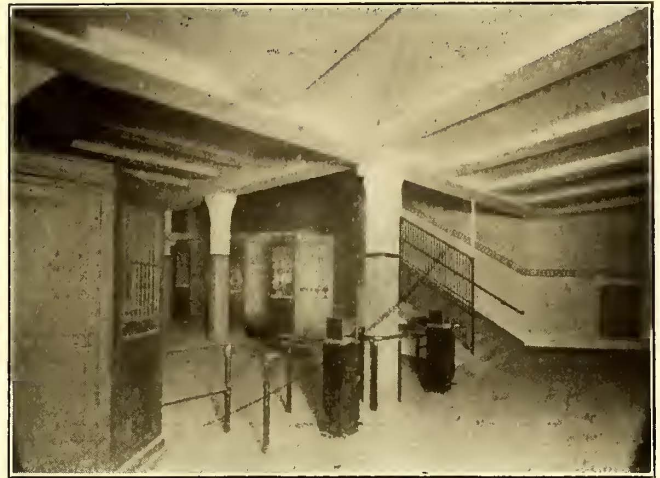
It is estimated that when in full operation it will increase the capacity of the Boston Elevated Railway Company's system in the downtown district about 175 per cent. Its cost, including the approaches and the equipment of the stations, is something over \$10,000,000.

embellishments of the tunnel and the stations are due to the suggestions made by the architects. They have given to the somewhat irregular stations as symmetrical an arrangement and as smooth walls and ceilings as could be obtained, with a view always of keeping everything free

from dirt and brake dust with which the air is charged.

The construction of the tunnel varies in different places, being adapted to the constantly changing conditions of the streets and buildings above it. In some parts vaulted concrete roofs are used, held together by tie rods. In other places the roof is spanned by steel girders, with concrete roof arches between. The new tunnel shows a great improvement over the Tremont Street subway in the fact that its alignment is almost straight. Trains leave the Boston Elevated structure at the corner of Washington and Castle Streets and enter the tunnel just north of the Boston & Albany Railroad crossing at Oak Street. The tunnel then runs approximately under Washington Street until it joins the Tremont Street subway near Haymarket Square. There are seven stations. Three of the stations are for southbound trains only, and three others serve only the northbound trains. The Union-Friend Station, with an entrance on Washington Street and one on Union Street, serves both the north and southbound trains. The three southbound stations are at Boylston Street, with entrances and exits on Lagrange and Boylston Streets; Winter Street, with entrances and exits on both Temple Place and Winter Street; Milk Street, with an entrance near Old South Church and at the corner of Devonshire and Water Streets. A passageway connects this station with the East Boston Tunnel and permits passengers from East Boston to transfer to southbound trains. The northbound stations are at Essex Street, with an entrance and exit on both Essex Street and Haywood Place; Summer Street, with an entrance and exit at Summer Street and Franklin Street; and State Street. The State Street station is en-

mit the accommodation of eight-car trains of the type of rolling stock now in use on the elevated structure. At the Milk Street station there are no columns on the platform near the cars. At other stations where columns are necessary, owing to the form of roof construction, they are placed as far as possible from the edge of the platforms.



Washington Street Subway—Entrance Lobby at Haywood Place

The finish of the station entrances varies with the surroundings, but the general type consists of a simple broad framework of hammered granite composition, from which there is bracketed an enriched bronze illuminated sign.



Washington Street Subway—Milk Street Station; Northbound Track Under Platform

tered through the existing entrance at the old State House and a new entrance on Adams Square. This station also serves as a transfer point for passengers between northbound trains and trains in the East Boston Tunnel. The platforms of all of these stations are 350 ft. long, to per-

In the upper part of the opening is an ornamental iron grill to permit air to enter the tunnel. Lettering on these screens indicates whether the stairway is an entrance or an exit. Further directions concerning routes are given on large marble signs built into the tiled walls of each en-

trance. The entrance lobbies under stations throughout have walls of white glazed tiles for about 6 ft. in height. Above this, white vitrified tiled mosaic is used for a frieze or cove, and is continued on the ceilings over the platform. A simple colored border separates these two materials. On the plain white cove or frieze large mosaic signs are placed, with the name of the station in glazed white letters on a colored ground. The base everywhere is of vitrified mosaic of a dark color and with a sanitary curved corner.

Where color is used in the tile work, as in the borders and signs, it is of a distinctive color for each station. The columns are painted of the same color, so that the

Advertisements are arranged regularly on the tile walls in uniform spaces, each surrounded by a brass frame. They are all in the lower part of the tiled walls, where they do not conflict with the names of the stations in the coves.

Hung from the ceiling, a large clock with a simple circular bronze frame is visible from any part of the station. Destination signs framed in a similar manner are hung from the ceiling and electric lights illuminate the signs, which change as the destination of trains makes necessary.

Package rooms, accessible both to those who have paid and have not paid fares, are provided. The openings into these have bronze doors. The upper half of the doors



Washington Street Subway—Winter Street Station, Showing Method of Lighting Platforms

traveler can recognize his position by the familiar color of the station.

The name of the station is in large mosaic letters on the cove or frieze opposite each car, but the smaller signs indicating the direction of travel, etc., are of enameled iron, and most of them agree in color with that of the station.

The ticket offices are novel in being made of sheet copper. The guard rails in front of the ticket sellers' windows are of bronze and the railings at the ticket choppers' stands are of brass pipe with ball supports. There are no doors at the entrances or exits of the tunnel. These are left open for ventilation, but wherever doors occur they are covered with sheet bronze and paneled.

opens and the lower half is capped by a broad bronze shelf for packages. All shelving in the package rooms is of metal.

The public and company telephone booths are placed as nearly in the center of the platforms as possible. They are constructed of fireproof materials. The walls are tiled to correspond with those of the stations. The doors are covered with sheet bronze. The news counters have masonry walls faced with glazed tiles to agree with the finish of the stations. A large copper hood when turned back against the wall holds the periodicals exposed for sale, but when swung over, covers the books and papers on the counter.

At State Street station, besides the stairs there are five

escalators—three at the south staircase and two at the north, to carry people between the train platform and a level nearer the State Street entrance. The balustrades of these escalators are covered with sheet bronze, and the wall that separate them from the adjoining staircases have glazed tiles.

The seats on the platforms throughout the stations are of cast concrete. The platforms are of finished granolithic, and the edge white porcelain cement, forming a conspicuous line at the edge of the platform. The hand rails on the stairs are of wood, which is more agreeable to the touch than brass. They are carried on bronze brackets or simple iron standards. Wherever division fences are required they are of very simple design, either of iron painted a brown color or of concrete.

The lighting is by incandescent lamps. These are so arranged behind beams or in the hollows of arched ceilings that although but little seen from the platforms, they give brilliant and agreeable illumination. To insure against cutting off of the current at any time, three independent sources of supply are available; two of these are from the power station of the railway, and one from the Edison Company, all so arranged that should the current be shut off from one source it is instantly supplied from another automatically.

To keep the tunnel free from water, pumping chambers are installed at three different places. In each of these chambers two pumps are installed, one with a capacity of 100 gal. per minute, and the other having a capacity of 1000 gal. per minute. The smaller pump is to take care of all water which will find its way into the tunnel under ordinary conditions of the most severe weather. The larger pump is to keep the tunnel clear of water in case of extraordinary circumstances. These pumps start automatically as the water rises in the drainage well. Should the water come in too fast for the smaller pump the larger one automatically cuts in.

There are four fan chambers situated along the length of tunnel; in each fan chamber two fans, capable of exhausting 25,000 cu. ft. of air per minute each, are installed, so that when all are running they will exhaust the foul air in the tunnel in a few minutes. The foul air is drawn out of the tunnel between stations through ducts constructed of concrete in the ceilings, and the fresh air enters at the several passenger entrances, insuring pure air at all times.

A great electrification project will probably be considered in the Prussian Diet this winter, says the *London Engineer*, for the Minister of Railways of that kingdom has ordered the engineers engaged in preparing plans for the electrification of about 300 miles of lines in and about Berlin to report to him this month. It is understood that there will be added two new tracks to the existing double-track City Railway, thus affording a line for express and a line for local trains each way, and the connection of the Potsdamer station with the Stettiner station by an underground railway. The cost of all these improvements is expected to be in the neighborhood of \$45,000,000. The main arguments for the electrification are drawn, it is anticipated, from the very successful operation by electricity of the Hamburg City Railway during the last year and a half. The suggestions for obtaining a revenue warranting such a great expenditure for electrification are interesting. Fares are so low in Berlin that it seems impossible for the City Railway to pay charges unless fares are materially increased.

NOVEL EXCURSION ON THE AURORA, ELGIN & CHICAGO LINES

As the result of a contract made last summer between the Aurora, Elgin & Chicago Railroad and the Chicago *American*, the railroad company during September handled an excursion which extended over a period of nearly five weeks and for which 50,000 round-trip tickets were sold. Through the courtesy of E. C. Faber, general manager of the Aurora, Elgin & Chicago Railroad Company, the *ELECTRIC RAILWAY JOURNAL* presents the details of this interesting joint arrangement for increasing electric railway traffic and daily newspaper circulation.

The Aurora, Elgin & Chicago Railroad Company operates two, three and five-car trains on 30-minute and 15-minute headway throughout the day between its terminal at Fifth Avenue in the business district of Chicago and Aurora and Elgin, Ill., each about 40 miles distant from the Chicago terminal. At Aurora and Elgin are many interesting scenic features, including at Aurora a park owned and operated by the railroad. This company also operates a 40-mile trolley line connecting the city lines in Aurora and Elgin. The route of the latter line parallels the Fox River throughout its entire distance. Thus it will be seen that this road can well afford to advertise for the pleasure-seeking traffic which is to be drawn from a city the size of Chicago.

The recent excursion, the arrangements for which are thought to be novel in the railway field, was the result of a contract made between the Aurora, Elgin & Chicago Railroad Company and the Hearst papers published in Chicago. The railroad company entered into the contract with a view to increasing its traffic and advertising its system as a pleasure route. The newspaper company was desirous of making an arrangement with the railroad whereby it could offer a ride over the railroad company's lines as a premium for increased circulation. In the struggle between the large daily newspapers of Chicago for increased circulation there have been many premiums offered to subscribers by the daily press. These have included the familiar book premiums, tables, clocks and guessing contests and club subscriptions of various sorts. Now that this excursion has successfully terminated the newspaper company states that it has secured far better results as regards increase in circulation by the distribution of tickets for the railway ride than have ever before been obtained.

The basis of the contract between the railroad company and the newspaper was that the railroad company should place at the disposal of the newspaper 50,000 round-trip tickets between Chicago and Elgin and Chicago and Aurora. The railroad company sold the tickets to the newspaper at a special reduced rate and in return for the special rate given received from the newspaper a large amount of advertising in the choicest space available in one daily edition. The fact that the railroad company was sure of receiving so much advertising extending over a period of more than five weeks was found to be ample justification for making the low rate. The policy of this reduction in rate for a round-trip ticket from \$1.10 as regularly charged to a much lower rate as paid by the newspaper may at first be questioned, but it was made plain in the contract between the railroad and the newspaper that the general policy of the railroad company should be amply protected in the advertising carried on by the newspaper. In all of the advertisements the newspaper endeavored to impress upon the public that it had paid a much larger

price for the tickets than its patrons were charged. In other words, the newspaper claimed that it had gone to a great expense to enable its readers to take advantage of the interesting trip. When protected by this feature in the advertising and publicity matter, and when it is remembered that the railroad received considerably more advertising space free than it could possibly buy for the difference between the full rate and the excursion rate for the entire number of passengers handled, it will be seen that the policy of the management in making the contract was sound.

The circulation of the newspaper was greatly increased by its method of disposing of these 50,000 tickets to its readers. For one entire week about one-fourth of a page of each issue of the daily papers was devoted to elaborate descriptions of the scenic features of the Aurora, Elgin & Chicago Railroad. These articles included carefully worded instructions as to how the readers of the paper might obtain coupons which, with 25 cents additional, would entitle them to receive a round-trip ticket over the road to Aurora or Elgin. Following this series of elaborate articles descriptive of the railroad and illustrated with many attractive engravings, the newspaper began printing in one edition each day the series of six coupons. One of these coupons is reproduced herewith. To its readers who col-



Aurora, Elgin & Chicago Excursion—Sample Coupon Exchanged for Ticket

lected the full series of six coupons and delivered them to an agent of the newspaper company there was given a round-trip ticket on a train of the Aurora, Elgin & Chicago Railroad at an extra cost to the readers of but 25 cents.

The newspaper handled the distribution of the 50,000 tickets which were available through 15 stores located conveniently in various parts of the city. It is a significant fact that one Chicago business house at the time these arrangements were being made offered to give a bonus of 5 cents on each set of coupons exchanged for a ticket at its store. The railroad company and the newspaper, however, did not think it wise to accept this offer because the readers desiring to take advantage of the excursion would be obliged to make a special trip to this one store in order to redeem their coupons. For this reason 15 stores in scattered locations were chosen as distributing points for the tickets.

During the week in which the coupons appeared in the newspaper there was such a demand for them that the regular edition in which the coupons were printed was exhausted early each day. The various newsdealers increased their regular orders, thereby greatly increasing the circulation of the paper. During the first few days of the week it was found that the newsboys in the business

district after taking care of their regular customers, clipped the coupons from their remaining papers and sold them at premiums varying from 10 cents to 15 cents. Steps, of course, were immediately taken to prohibit this practice because it was desired that every coupon published should be redeemed and a ticket purchased.

During the entire week the newspaper continued its series of articles outlining the attractive features of the road. Each of these articles was given space on the first page of the paper and editorial announcement also was made calling attention to the favor which the newspaper was conferring upon its readers. This advertising will be of considerable value to the railroad in the future and it must be remembered that much choice space was given over to praise of the road which could not have been purchased under any consideration. The newspaper sent its photographers over the electric line in a special train so that a large number of views could be taken to illustrate the articles.

In the preliminary arrangements for the sale of this large number of tickets the transportation department of the railroad was carefully protected. The contract for the 50,000 round-trip tickets was so worded that it included a detailed statement of the number of passengers to be carried each day and the time of leaving at all terminals for both trips taken by each passenger; thus the problem of taking care of so large an additional traffic was carefully worked out and the railroad company's interest in caring for its regular passengers safeguarded. A certain number of tickets were issued for each day and each ticket had printed on its face the leaving time from the Chicago terminal and from the western terminals. Tickets were void on any train except the one leaving at the time printed thereon. In this way the transportation department of the railroad could estimate the excursion traffic for each day for each of its regular trains and determine closely how many people had to be moved at each hour. While an excursion caring for 50,000 people is considered large, the burden upon the transportation department with this number distributed among the trains operated during 30 days was not found to interfere with the regular patronage. The excursion tickets were not made good for Saturday, Sunday or holidays, and therefore an additional protection was assured the regular patronage.

In dividing up the tickets for each day it was arranged that the trains leaving Chicago in the morning carried passengers as follows: 8:00, 8:30, 9:00 and 9:30, 100 passengers each; 10:00 and 10:30, 300 passengers each. The 10:00 and 10:30 trains were run special and comprised five cars each. A similar arrangement was made for honoring the tickets on the return trips from Elgin and Aurora. In this way it was possible to add a definite number of cars to each train and make sure that there would be ample provision for carrying the regular and the excursion traffic.

On account of the limited express service which is operated from the western terminals into Chicago in the morning and from Chicago westward in the afternoon cars were available for these two special trains operated each day. Thus the cars which ran into Chicago on limited time each day and ordinarily deadheaded back were utilized to carry the 300 excursion passengers at 10:00 and at 10:30.

The railroad company arranged with the newspaper so that when each ticket was delivered to a purchaser he was handed two neat four-page folders. These folders de-

scribed the attractions to be found at the terminals of the railroad company in Elgin and Aurora. The folders were so well printed that it was found they were saved for future reference. When passengers boarded the trains they were handed the regular folders and timetable of the railroad company which includes a large scenic map of the route. In this way effective advertising was done. To promote the excursion the newspaper company also placed large posters on 100 of its delivery wagons used on the streets of the city during all the hours of daylight each day. These posters exhibited the name of the road in large letters together with a picture of the trains, and in this way the railroad company received a considerable amount of general advertising.

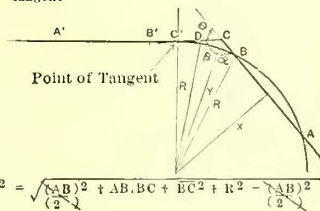
The expectations of the railroad company in a financial way were fully met. The traffic was found to be composed of well-behaved people who went to the terminal cities of the electric road with a good time in view. It was found that from 65 per cent to 70 per cent of these people who went to Aurora and Elgin took the side trips to the railroad company's parks and paid the regular street-car fare necessary to reach these places. During their stay at the terminal cities the excursionists patronized the local merchants and in this way the excursion was appreciated by the regular patrons of the road. It is thought that the great amount of advertising which this excursion brought about will have a lasting effect tending toward a considerable increase in regular as well as pleasure traffic.

FINDING DRAWBAR SWING ON CURVES

Norman Litchfield, engineer of car equipment, Interborough Rapid Transit Company, has devised two formulas for finding the drawbar swing on curves of any given radius. The first formula covers the case where the drawbar is

(A) Drawbar pivoted at point forward of body bolster.

AB = Center to center of bolster of car on curve
 A'B' = " " " " " " " " tangent
 BC = Center of bolster to center of auxiliary bolster
 CD = Length of drawbar of car on curve
 C'D = " " " " " " " " tangent
 R = Radius curve
 C = Point of tangent



$$\textcircled{1} \theta = \frac{180 - (\alpha + \beta)}{2}$$

$$x = \frac{R^2 - (AB)^2}{2R}$$

$$y = \sqrt{\left(\frac{AB + BC}{2}\right)^2 + R^2 - \left(\frac{AB}{2}\right)^2} = \sqrt{\left(\frac{AB}{2}\right)^2 + AB \cdot BC + BC^2 + R^2 - \left(\frac{AB}{2}\right)^2}$$

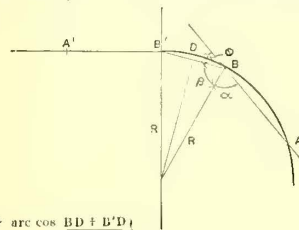
$$\textcircled{2} \cos \alpha = \frac{BA + BC}{2y} = \frac{BA + 2 \cdot BC}{2 \sqrt{\left(\frac{AB}{2}\right)^2 + AB \cdot BC + BC^2 + R^2}}$$

$$\textcircled{3} \cos \beta = \frac{(CD + C'D)^2 + AB \cdot BC + BC^2 + R^2 - x^2}{2(CD + C'D) \sqrt{AB \cdot BC + BC^2 + R^2}} \text{ (Law of Cosines)}$$

$$\textcircled{4} \theta = 180^\circ - \left\{ \frac{\arccos \frac{BA + 2 \cdot BC}{2 \sqrt{\left(\frac{AB}{2}\right)^2 + AB \cdot BC + BC^2 + R^2}} + \arccos \frac{(CD + C'D)^2 + AB \cdot BC + BC^2}{2(CD + C'D) \sqrt{AB \cdot BC + BC^2 + R^2}}}{2} \right\}$$

(B) Drawbar pivoted at center pin.

AB = Center to center of bolster
 BD = Length of drawbar
 R = Radius curve



$$\textcircled{1} \theta = 180^\circ - (\alpha + \beta)$$

$$\textcircled{2} \cos \beta = \frac{BD}{R} = \frac{BD + B'D}{2R}$$

$$\textcircled{3} \cos \alpha = \frac{BA}{2R}$$

$$\textcircled{4} \theta = 180^\circ - \left\{ \frac{\arccos \frac{BA}{2R} + \arccos \frac{BD + B'D}{2R}}{2} \right\}$$

Formulæ for Calculating Drawbar Swing on Curves

pivoted at a point forward of the body bolster, and the second where the drawbar is pivoted at the center pin. The solutions are presented in full to show the simple algebraic and trigonometric means used to find θ , the angle of drawbar swing.

NOVEMBER MEETING OF THE CENTRAL ELECTRIC RAILWAY ASSOCIATION

The last meeting of the Central Electric Railway Association for the year 1908 was held at Lima, Ohio, on Nov. 19, with President F. D. Carpenter, general manager, Western Ohio Railway Company, in the chair. The attendance at this meeting was considerably larger than usual and the interest in the program was evidenced by a lively discussion of the subjects introduced.

After the reading of the minutes of the previous meeting by the secretary, A. L. Neereamer, the president called for a report from the committee on "Charges for Handling Equipment When Used on Lines Owned and Controlled by Member Companies." This committee comprised: H. A. Nicholl, chairman, Indiana Union Traction Company; A. A. Anderson, Indianapolis, Columbus & Southern Traction Company; C. D. Emmons, Ft. Wayne & Wabash Traction Company. The report, as presented, follows:

Passenger Equipment.—Motor car, 4 cents per mile, and trail car, 2 cents per mile, with a minimum of 100 miles for each 24 hours or fraction thereof where actual mileage does not exceed this amount. In the latter case actual mileage will be counted.

The above minimum of 100 miles shall apply only when chartered car rates are charged. For other service the following rates will be used:

Passenger Motors.—Twenty-five miles or less, minimum of \$1; 50 miles and over 25 miles, minimum of \$2; 75 miles and over 50 miles, minimum of \$3; 100 miles and over 75 miles, minimum of \$4. Over 100 miles, 4 per cent per mile, actual mileage.

Passenger Trail Cars.—Fifty miles or less, minimum of \$1; 100 miles and over 50 miles, minimum of \$2. Over 100 miles, 2 cents per mile, actual mileage.

The above rates are for motor and trail cars for each 24 hours or fraction thereof.

Freight Equipment.—Motor cars, 3 cents per mile, with minimum of \$1 for 25 miles or less; \$2 for 50 miles or over 25 miles; \$3 for 100 miles or over 50 miles. Over 100 miles at 3 cents per mile for each 24 hours or fraction thereof.

Trail cars, box, flat or gondola cars, 2 cents per mile, with a minimum of 50 miles for each day, allowing 48 hours from the time of delivery for receiving road to unload and return car. After 48 hours a per diem charge of \$1 per day for the first day, \$2 for the second day, \$3 for the third day and \$4 for each additional day beyond the 48 hours that this car is held on the foreign line shall be made.

The delivery and interchange of this equipment at junction points shall be made under the M.C.B. rules now in effect on steam lines covering the interchange of equipment, so far as these rules will apply.

In the movement of passenger equipment, when a car furnished by one line goes onto the tracks of another line, the receiving line shall furnish a pilot for the safe movement of this car and shall pay the crew of the car from the time it is delivered to the receiving line until such time as it is returned to the delivering line, except that the expense of the lay-over time of the crew on the receiving line shall be prorated between the lines interested according to the mileage made by the equipment.

For cars offered to a line for movement to any given point and not loaded, the following charges shall be made against the line offering the cars for movement:

Motor car, either passenger or freight, on its own power, if handled by its own crew, 25 cents per mile, the receiving line to furnish and pay for pilot. If hauled as a trailer behind regular service, 20 cents per mile.

The above rates do not apply to the movement of new equipment where there are possibilities of delays caused by hot boxes, stiff running cars, etc., and for such movements special arrangements must be made between the lines interested.

After the reading of this proposed schedule of charges the association voted its approval and immediately the following electric railways signified their willingness to handle equipment according to the schedule:

Western Ohio Railway Company.
 Indiana Union Traction Company.
 Ft. Wayne & Wabash Valley Traction Company.
 Ft. Wayne & Springfield Railway Company.
 Indianapolis, Columbus & Southern Traction Company.
 Dayton, Covington & Piqua Traction Company.
 Lake Erie, Bowling Green & Napoleon Railway Company.
 Dayton & Troy Electric Railway Company.
 Lake Shore Electric Railway Company.
 Marion, Bluffton & Eastern Traction Company.
 Toledo, Fostoria & Findlay Railway Company.

It is expected that this list will be rapidly enlarged by the addition of other roads in the Central territory.

When presenting the foregoing schedule of charges H. A. Nicholl said that the committee had determined upon these rates because several of the roads interested had found a similar schedule of charges to be satisfactory. C. D. Emmons, Ft. Wayne & Wabash Valley, had used a similar basis and he explained that while the charges were arbitrarily chosen the arrangement and payment for service was reciprocal and therefore fair. The charges as included in this schedule are not for regular daily service of connecting lines, but are to be used in handling foreign cars. This schedule will enable agents to immediately quote rates to a prospective party desiring transportation over the lines of any of the concurring companies. The schedule of charges as explained by A. A. Anderson should early be made effective by receiving the approval of all companies that are members of the Central Electric Railway Association. The secretary was instructed to keep all companies approving this schedule of charges informed of the concurrence by other companies.

Secretary Neereamer read a letter from B. V. Swenson, secretary, American Street & Interurban Railway Association, who complimented the Central Electric Railway Association on the good results of its work and asked that the relations between the two associations be even more closely united, so that the advantages of co-operation might be realized.

President Carpenter appointed the following committee on nominations, which was instructed to report at the annual meeting of the association to be held at Indianapolis, Ind., Jan. 28, 1909: C. D. Emmons, J. H. Crall, W. S. Whitney, George Whysall, S. D. Hutchins.

SUPPLY MEN'S ASSOCIATION

The executive committee of the Central Electric Railway Supply Men's Association, S. D. Hutchins, chairman, announced that the dues for the member companies during 1909 would be \$8, the same as last year, and that representatives of member companies could be supplied through Secretary Neereamer with neat celluloid identification disks, which should be worn in connection with the regulation association buttons at all meetings. It is expected that each manufacturer's representative attending the meetings will have such a badge. Mr. Hutchins explained that hereafter the secretary of the Central Electric Railway Association would publish with each announcement of forthcoming meetings a list of the manufacturers who were members in good standing of the Central Electric Railway Supply Men's Association.

President Carpenter announced that on Nov. 18 the Cen-

tral Electric Traffic Association had held two sessions and made considerable progress in obtaining basing rates for the passenger tariff which the association will publish. When this tariff has been completed and printed it will show the rates from any point on each member company's line to any point on any other member company's line or will provide means for quickly ascertaining such rates; thus the station agents of the member companies will immediately be able to give any intending passenger the through rates to all points in the Central territory. President Carpenter thought that with this passenger tariff available in connection with the schedule of charges for handling equipment as approved and earlier presented here, there would follow a decided increase in long-distance travel. He urged that those railway companies which had not given the secretary the necessary credentials for filing their tariffs make every effort to do so at once so that the forthcoming association tariff schedules might be most complete.

WATER PURIFICATION

H. E. Sibson, Harrison Safety Boiler Works, Philadelphia, presented an address on "The Purification and Heating of Water for Boiler Feed and Other Purposes." An abstract of this address follows:

The matter of preparing water for central station needs is an important one. Such water should be heated to as high a degree as possible and it should be free from oil and substances that will form scale or corrode the boilers.

Various appliances of greater or lesser merit are before the public for accomplishing the purification and heating of the large quantities of water needed in central station practice. These must be discussed separately since their functions vary over a wide range and no one apparatus can be regarded as a "cure all" for all cases.

The problem of purifying exhaust steam containing oil so that this exhaust can be conserved and utilized can be accomplished by the old method now almost entirely unheard of of skimming off the oil from the surface of the condensed steam and of further removing the oil in emulsion by passing the water through a filter of wood, wool, quartz or other retentive matter. This method is open to criticism, the results being entirely dependent on the attention given by the operating staff, who are required periodically to clean out and renew the filter beds, a duty in many cases overlooked and neglected, too late, however, to prevent damage to the boilers.

Engineering practice has recognized the good results that oil separators give in removing oil from exhaust steam when correctly proportioned for the work properly installed and drained by some approved method. The separator may be on an atmospheric exhaust line or on a vacuum line between engine and condenser where high velocities obtain, but in every case absolute success is assured if several factors are given consideration: The separator must be of a size ample for the work in hand and must be correctly installed. The drainage apparatus must be of approved design and the oil used of a grade which will not volatilize at the temperature of the steam in the high-pressure cylinder. Oil separators installed and operated in conformity with the foregoing suggestions will so satisfactorily purify the exhaust steam from oil that when condensed it may be used again for boiler feed or for manufacturing purposes. This condensed exhaust is in reality distilled water containing a minimum amount of impurities.

The water obtained from wells and streams, however, is in the great majority of cases bad—that is, impregnated to a greater or lesser degree with scale-forming ingredients. These impurities will sometimes respond to the heating action of exhaust steam in an open heater and require no further treatment. Again, treatment with chemicals may be a real necessity. For accomplishing the desired results two types of apparatus are presented for consideration: First, the cold process purifying apparatus, which, as its name designates, purifies the water cold, after which it must be heated in a heater, preferably of the open type, to

allow for the expulsion of gases, etc., before being fed to the boilers; second, the type of purifying apparatus known as the hot process purifying system. The latter takes advantage of the well-known fact that water responds more quickly to the chemical reactions when in a highly heated state than when cold. The apparatus is so designed that simultaneous with the heating of the water the needed chemical reagent is added to neutralize or overcome the impurities contained and to set up the reactions which bring about the precipitation in the system before the water is fed to the boilers. A large surface is provided upon which the precipitate may be retained and an upward filtration assures an ample supply of clear water for the most exacting needs. This apparatus also performs the duties of the feed-water heater, thus considerably reducing the cost were it purchased as a separate appliance.

The hot-process purifying system performs all the functions of the cold-process system and further increases the efficiency and results by heating the water to a high degree. These systems are practically automatic in operation, can be installed in a comparatively small space, can be attended to by the regular operating force, are easy to clean and will assure a supply of hot water for boiler feed or other purposes of such a soft nature that no scale can form.

In closing the discussion of water purification it can only be said that the topic is of such paramount importance that all those concerned with the design, erection or operation of boiler plants should at the start carefully investigate the make-up of their intended feed supply, have analyses made by capable chemists and consult with a reputable firm with experience in this all-important line of work.

In discussing his subject Mr. Sibson said when questioned that galvanic action in boilers only could be avoided by the use of zinc plates placed within either the boiler or the separator. A 2800-hp boiler equipment had come within his knowledge, which equipment in four months' time had been severely damaged. It was first thought that the damage in these boilers was due to acid in the water. After a careful investigation extending over several months and after many analyses of the water had been made this was found not to be the cause. The analyses then showed the water to be so pure that a slight amount of lime was added in an endeavor to correct the erosion. This treatment was not found satisfactory and the boilers in this instance only could be maintained in a safe condition by the use of counter currents of electricity to balance the existing galvanic action.

G. H. Kelsay, Indiana Union Traction, asked how often it should be necessary to analyze or check the quality of boiler feed water. Mr. Sibson replied that feed water was obtained ordinarily from two sources—deep wells and streams—and frequently from a combination of these two. In the course of regular operation where deep well water and stream water are mixed the makeup varies greatly. Also the quality of water flowing in a stream varies from day to day and the water obtained from these wells necessarily changes its character as the rock and loose material at the bottom of the well are eroded. Therefore, in general the character of water from any source of supply does not remain constant and analyses should be made in a complete way at least once every six months. Mr. Sibson also said that where water is purified tests could profitably and conveniently be made from hour to hour so that the purification chemicals might be added or varied to suit the changing chemical composition of the boiler feed.

A simple method of determining whether enough or too little soda or caustic was being added was to draw off each hour a glass of water and into this water put a drop of phenol phthalene. A mixture of phenol phthalene could be obtained diluted with alcohol at any drug store. Care should be taken that only the best quality of alcohol be

used in diluting the mixture. A single drop of this mixture put in a tumbler of water immediately gives the water a distinct color showing its relative acidity.

HANDLING UNITED STATES MAIL

C. M. Paxton, general manager, Dayton & Troy Electric Railway, presented a paper entitled "The Possibilities for Handling United States Mail and the Compensation Paid by the Government." This paper was presented in the *ELECTRIC RAILWAY JOURNAL* for Nov. 21, page 1421.

In discussing the subject of mail cars Mr. Paxton said that the Government specified the construction of cars, both inside and out, where cars were to be used only for handling mail; but when a compartment of a car for other service was to be used the Government specified only the inside fittings. It also was required by the Government that wherever railway companies desired to load mail on moving cars the railway companies should install mail cranes.

A. A. Anderson, general manager, Indianapolis, Columbus & Southern Traction Company, described the mail service which his company operates between Indianapolis and Columbus, Ind., 43 miles. The company had been requested to extend the service, but had refused to do so because it felt entitled to higher rates than the Government offered. One reason why the service was expensive for the railroad was because the Government required that one of the train men should leave the car at stopping points to deliver the pouches inside the post-office doors.

I. L. Oppenheimer, Ohio River Electric Railway & Power Company, said that his road had had a contract for carrying mail, which contract had later been canceled after the railway company had given the Government 30 days' notice. The railway had refused the service because the post-offices where the mail had to be delivered were, in some instances, more than 60 rods from the stations. This necessitated extra men on the mail cars. After the railway had had the contract discontinued the Government advertised the mail route and let the contract to another carrier, who was given practically the same pay for four-sevenths of the service earlier given by the railway. This makeshift service, on being found unsatisfactory, was discontinued and the contract again given to the railway company, but with the objectionable restrictions removed.

Mr. Paxton thought that there was no law, but only a regulation, which gave the company carrying mail the right to insist that an unprofitable contract be discontinued after 30 days' notice. Mr. Paxton said that where the character of service warranted the postal authorities might increase the rate from 3 cents to 4 cents. The post-office officials recognized that in general existing rates for handling mail were low and believed higher rates justifiable, in many instances, if they could be allowed by law.

C. D. Emmons, Ft. Wayne & Wabash Valley, mentioned the discussion on the subject of mail at the Atlantic City convention and said that the American Street & Interurban Railway Association now had a committee working in the interest of those companies desirous of handling mail.

The association instructed the chair to appoint a committee of three which would volunteer to assist the earlier mentioned "Committee on Handling Mail" of the American association.

AFTERNOON SESSION

Frank Tallmadge, Columbus, Ohio, addressed the association on the subject of "The Claim Department." He made an eloquent plea for the establishment of funds which

would provide in advance for meeting casualty losses. Mr. Tallmadge described in detail his ideas of the proper organization of a claim and legal department for an electric railway. He told of the work of the index bureau located at 1245 Old Colony Building, Chicago, and the good results to be obtained by the exchange of information on the subject of accidents. The work of the United Railways & Electric Company of Baltimore in educating the public by means of bulletins in the daily newspapers was discussed and complimented by Mr. Tallmadge. It will be remembered that this series of bulletins was reprinted in part in the *STREET RAILWAY JOURNAL* during the early part of the present year.

A paper on "Railroad Crossings" was presented by W. C. Sparks, superintendent track and roadway, Indiana Union Traction Company. This paper was published in the *ELECTRIC RAILWAY JOURNAL* for Nov. 21, page 1419.

When questioned Mr. Sparks said that the steam railway companies within his experience did not object to the use of hard-center crossings. Mr. Sparks was asked for his ideas with regard to the use of plates under the center of built-up intersections. He did not favor them because of the liability of their becoming loose and rattling. The purpose of such plates was to prevent the rails from cutting into the ties and Mr. Sparks thought that equally good results could be obtained by turning the supporting timbers. He described the special concrete foundation which it is proposed to test under railway crossings on the Indiana Union Traction line. This concrete foundation would support a generous bed of selected broken stone which in turn would support the ties and rails. It was essential in this crossing foundation to make sure that the bed of ballast is thoroughly drained and therefore he proposed to slope the upper surface of the concrete foundation either in all directions from the center so that the water would run off the sides or toward the center so that the water could be carried away by a drain. He thought that such a concrete foundation could be installed with both tracks in service by supporting the rails on timber and filling the concrete in between.

One speaker suggested that the steam railroads possibly might object to hard-center crossings on the score of rigidity and the attendant severe shocks to passing trains and locomotives.

DISCUSSION OF BUSINESS SITUATION

A discussion on the effects of the recent financial depression on earnings of interurban roads and the lessons to be learned from the experiences of the past 12 months was introduced by E. C. Spring, Dayton, Covington & Piqua. Dayton, the principal terminus of Mr. Spring's road, was said to have 1500 factories, a large number for a city of its size, and therefore the riding public of Dayton quickly felt the financial depression when the operations of the factories were cut down. The lack of traveling also showed an immediate effect in the receipts of the interurban lines. After business became dull in the cities the farmers rode less and less. Mr. Spring said that notwithstanding the severity of the test the interurban roads of the Central West had so safeguarded their expenditures that many of them were now in as good condition as ever before. The loss of traffic during the past year as compared with previous years had brought about some conditions from which valuable lessons were to be learned, lessons in economy of operation and in preparing for emergencies. Many roads which until a year ago had been thought to be carefully operated had found that under stress

of circumstances many economies could be introduced. A valuable lesson, therefore, was that the passing depression had taught managers to go deeper and deeper into the details of operation. The time for this study had been made available by the lack of traffic. As a result Mr. Spring said that the interurban properties within his knowledge were now being given more care as regards expenditures and details of management, the benefits of which would revert to the stockholders. Mr. Spring carefully described how the lack of traffic had spurred on the interurban roads to a greater activity in the development of new business. During the past year special efforts had been made to get traffic never before considered of enough importance to warrant the proper solicitation. As an illustration of the latter lesson Mr. Spring said that the Dayton, Covington & Piqua management had for the first time taken an interest in political work. This interest, however, was shown to both parties. It resulted in the holding of political gatherings of both parties in each town along the line. In this way a considerable amount of traffic was originated.

W. E. Rolston, superintendent of power and shops, Cleveland, Southwestern & Columbus, discussed the economies in shop work which the lack of traffic had made possible. He said that with the decrease in receipts it became necessary for the operating and mechanical departments to commensurately lower the costs for operating and maintaining the cars. It was emphasized that close attention to inspection effected a considerable saving in repair work and that when small repairs were made immediately on being found they sometimes would cost only one-half of that necessary to make repairs of a similar kind after more considerable delay. The decreased demand for labor had made it possible to obtain better workmen than before and therefore as a whole the shop work could be more economically handled.

Charles L. Henry, president Indianapolis & Cincinnati Traction Company, optimistically echoed the lessons earlier expressed by Mr. Spring and complimented the association on the work which it had done in assisting the electric railways of the Central States. Mr. Henry cited from a recent conversation with regard to the good effect of the financial depression on the value of traction securities as compared with the securities of steam railroads. He said that to those unacquainted with the details of traction finances it had seemed that traction securities were not good purchases because some people were under the impression that the electric roads had suffered from losses equal in amount with the steam roads. The comparison, of course, was not fair because the careful study of financial reports showed that the electric lines had suffered far less than their steam competitors. When this situation was clearly explained to the purchasing public it would no doubt be of considerable benefit in electric railway financial circles.

The accumulator cars to be used on the railway from Mayence to Münster, Germany, weigh, with passengers, 62 tons, and the energy consumption at a speed of 45 km (27 miles) per hour averages about 12 watt-hours per ton-kilometer. This includes the energy consumption of one start. The road has some grades of 0.5 per cent and several sharp curves.

The interurban railways of Indiana carried 28,482,487 passengers last year, the total fares amounting to \$9,249,902, an average of about 33 cents a passenger.

MEETING OF THE CENTRAL ELECTRIC TRAFFIC ASSOCIATION

The Central Electric Traffic Association met at Lima, Ohio, on Nov. 18, holding two sessions, with A. L. Neereamer, chairman, presiding. About 50 representative traffic men were present.

The association voted to hold regular meetings hereafter on the first Saturday after the tenth of each month. These meetings will be held at the headquarters of the association in the Traction Terminal Building at Indianapolis. The plan of holding meetings one day previous to the sessions of the Central Electric Railway Association bi-monthly meetings will be discontinued.

It was announced that J. T. Britton had been appointed to the secretaryship of the Central Electric Traffic Association and would assist Mr. Neereamer at the headquarters of the association.

The committee on uniform bill of lading reported that it was not obligatory, according to rules of the Interstate Commerce Commission, that the uniform bill be used by roads using the official classification. The association voted to adopt as standard for the Indiana lines the "original" uniform bill of lading and for the Ohio lines the "new" bill of lading lately approved by the Interstate Commerce Commission.

A committee was appointed to consider the matter of increased freight rates on steam lines. This committee comprises: J. C. Forrester, Ohio Electric Railway; C. C. Collins, Western Ohio Railway; F. D. Norviel, Indiana Union Traction Company; F. W. Brown, Michigan United Railways; H. E. Vordemark, Ft. Wayne & Wabash Valley Traction Company.

In accordance with the following bulletin addressed to members from the office of Chairman Neereamer, the traffic representatives spent the afternoon in tabulating and checking in rates to the headline points included in the bulletin:

You will receive under separate cover a supply of blanks to be used in compiling rates for the new selling and basing rate sheet.

The following have been selected as headline points and should be observed when compiling:

Battle Creek, Mich.	Lima, Ohio
Bluffton, Ind.	Logansport, Ind.
Chicago, Ill.	Louisville, Ky.
Cincinnati, Ohio	Marion, Ind.
Cleveland, Ohio	Michigan City, Ind.
Columbus, Ohio	Muncie, Ind.
Crawfordsville, Ind.	Newark, Ohio
Dayton, Ohio	Norwalk, Ohio
Detroit, Mich.	Peru, Ind.
Elkhart, Ind.	Piqua, Ohio
Findlay, Ohio	Richmond, Ind.
Fort Wayne, Ind.	Sandusky, Ohio
Fostoria, Ohio	South Bend, Ind.
Goshen, Ind.	Springfield, Ohio
Indianapolis, Ind.	Terre Haute, Ind.
Jackson, Mich.	Toledo, Ohio
Kendallville, Ind.	Union City, Ind.
Kokomo, Ind.	Wabash, Ind.
LaFayette, Ind.	Warsaw, Ind.
Lansing, Mich.	Zanesville, Ohio

A. L. NEEREAMER, Chairman.

A blank form prepared by Chairman Neereamer was used. When properly filled out one of these blanks will form "copy" for a page of the passenger selling and basing rate sheets which, in complete form, will be published to show rates between all stations in the Central Electric territory. After this rate sheet has been completed a similar method will be used in preparing rate sheets for freight traffic. The association adjourned to meet on Dec. 12.

MEETING OF THE CENTRAL ELECTRIC ACCOUNTING CONFERENCE

The Central Electric Accounting Conference met at the Lima House, Lima, Ohio, on Nov. 18, 1908. The meeting was called to order at 1:00 p.m. by the chairman, M. W. Glover, auditor, Ohio Electric Railway.

On motion of S. C. Rogers, treasurer, Mahoning & Shenango Railway & Light Company, the chairman was instructed to appoint a committee to draft a constitution and by-laws for the Central Electric Accounting Conference and present them at the next meeting. The following committee was named: A. F. Elkins, chairman (Columbus, Delaware & Marion Railway), H. E. Vordermark (Ft. Wayne & Wabash Valley Traction Company) and C. B. Baker (Western Ohio Railway).

The committee on uniform blanks presented its report, together with samples of each of the blanks recommended for adoption. On motion of Mr. Elkins the committee was requested to have samples of these blanks printed or mimeographed and forward a sample of each blank, together with a copy of the report, to each member of the conference, so that, at the next meeting, the members will be familiar with the proposed forms and be prepared to adopt uniform blanks for the handling of interline freight and ticket accounts. The report of the committee follows:

REPORT OF COMMITTEE ON UNIFORM BLANKS

Your committee on interline accounting forms has procured from member companies copies of their forms and, as far as possible, descriptions of their methods of handling interline traffic, both passenger and freight.

A wide diversity appears to obtain both in method, in form of blanks, and in size of blanks, and your committee does not believe it wise at this first report to do more than suggest for your consideration and discussion the shortest list of forms which would appear to be absolutely necessary for the proper handling of interline business. This list is as follows:

Passenger Form 1—Statement of interline tickets issued	8½ by 13
Passenger Form 2—Statement of ticket differences	13 by 8½
Passenger Form 3—Monthly statement of interchangeable mileage coupons—Central Electric Traffic Association.....	8½ by 5½
Passenger Form 4—Monthly statement of interchangeable coupons—Central Electric Railway Association.....	8½ by 5½
Passenger Form 3-4 A—Statement of interchangeable coupons, covering all classes	8½ by 5½
Freight Form 5—Uniform bill of lading and shipping order	5½ by 8½
Freight Form 6-A—Interline way bill, expense bill, etc.....	8½ by 5½
Freight Form 6-B—Interline way bill, expense bill, etc.....	8½ by 5½
Freight Form 7—Daily passing report.....	8½ by 13
Freight Form 8—Agent's way bill correction or	8½ by 5½ 8½ by 11
Freight Form 9—Auditor's settlement, way bills received	8½ by 14
Freight Form 10—Division of revenue on interline way bills	14 by 8½
Freight Form 11—Account current or summary of account	8½ by 14
Freight Form 12—Statement of differences on interline freight account.....	14 by 8½
Freight Form 13—Correction account, adjusting differences in settlement of interline freight account	14 by 8½

The widest difference in practice is probably found in the way bill and related forms. After going into the matter carefully, your committee feels that for interurban practice the five-part way bill, carrying original way bill,

expense bill, auditor's copies and agent's copy, all made at one time through carbon by billing clerk, is preferable. Of this type of bill there are two classes now in use, adapted to varying accounting conditions.

In the bill used in Indiana the original way bill and expense bill go forward with the shipment, the receiving agent delivering the expense bill to the consignee and retaining the original way bill receipted by the consignee as his delivery receipt. Two auditor's copies are provided, one of which is sent to the company auditor, while the other is sent to the foreign auditor by the forwarding agent. The fifth copy is retained by the forwarding agent as his office record.

In the other type the original way bill, the expense bill and a delivery receipt go forward with the shipment; the original way bill being taken up on a daily report and forwarded to the company auditor by the receiving agent; the expense bill being delivered to the consignee in the usual way; the delivery receipt being signed by the consignee and retained by the receiving agent for his office record. The fourth copy is a duplicate of the original way bill, and is sent by the forwarding agent either to the company auditor for forwarding or direct to the auditor of the connecting line. The fifth copy is an agent's copy held by the forwarding agent for his office record.

Both types of bill are included in the list.

Your committee has sketched roughly the forms as listed above, showing the exact sizes of sheets and spacing as suggested.

We believe that the aligning of this interline form work is of the utmost importance to the member companies in handling this class of business, not only in the accounting departments, but in the traffic and operating departments as well, and earnestly trust that the matter as placed before you be given your careful and patient attention.

We know that in some of the forms, and especially in the matter of billing, the adoption of the forms here suggested will make a sharp change from present practice for some of our companies, but the plan is working so satisfactorily with the largest of our interurban lines, as well as some of those of lesser mileage, that we have proposed it with confidence.

We by no means feel that this report, with accompanying sketches, adequately covers the subject in hand, but submit it rather in the hope that putting it thus in concrete form may enable each member of this conference to study its proposed features with direct reference to the requirements of his own line, and from this standpoint to make criticisms and suggestions which shall be direct and to the point. It is only through criticisms of this kind, made in a spirit of fairness and with a willingness to waive the lesser points of difference and to unite on the essentials, that we may hope to succeed in this movement, which some of you have already learned is likely to become of the greatest importance in your office routine and departmental expense—and is also likely to have an important bearing on your earnings account.

The report was signed by the following: W. B. Wright, chairman (Indianapolis & Cincinnati Traction Company), L. T. Hixson (Terre Haute, Indianapolis & Eastern Traction Company) and C. B. Baker (Western Ohio Railway).

ACCOUNTING FOR TRAFFIC ASSOCIATION MILEAGE

The chairman submitted a report on accounting for the new Central Electric Traffic Association mileage and the settlement of interline freight and ticket accounts, showing the plan adopted by each company for settling interline balances. F. D. Carpenter, president of the Central Electric Railway Association, was present and stated that the new interchangeable mileage books will be placed on sale on Jan. 2, 1909. The report of Chairman Glover on this subject follows:

At the meeting of the Central Electric Accounting Conference in Indianapolis, on Oct. 3, 1908, the chairman was instructed to forward to each member of the conference, and to all members of the interchangeable mileage agreement, a copy of the report of the standing auditing committee of the Central Electric Railway Association, and

ask each line to advise a method of settlement to cover interline accounts and interchangeable mileage.

In accordance with these instructions, I wrote to all members on October 5, submitting the following plans of settlement, and asked for an expression as to which plan would be adopted:

Plan 1

Settlement to be made monthly on balances; the creditor line to make draft on the debtor line for balance due each month. Draft to be made on the twenty-fifth day of the calendar month succeeding the month in which the interchangeable coupons and interline tickets were lifted.

Plan 2

Settlement to be made on balances, the debtor line forwarding a voucher in favor of the creditor line for balance due on or before the twenty-fifth day of the calendar month following the month in which the interchangeable coupons and interline tickets were lifted.

Plan 3

Settlement to be made by voucher; each line making a voucher for total of the interline ticket report as rendered, forwarding this voucher on the twenty-fifth day of the calendar month following the month in which the interchangeable coupons and interline tickets were lifted.

It was necessary to write some lines two and three times for a reply, and the following lines have failed to acknowledge receipt of my several letters, or to advise which plan of settlement they will adopt:

Columbus, Marion & Bucyrus Railroad, Delaware, Ohio.
Indianapolis, Crawfordsville & Western Traction Company, Indianapolis, Ind.

Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio.

Lebanon-Thornton Traction Company, Indianapolis, Ind.

The following lines have signified their intention of adopting Plan 1:

Chicago, South Bend & Northern Indiana Railway.

Evansville & Southern Indiana Traction Company.

Evansville Railways Company.

Fort Wayne & Wabash Valley Traction Company.

Indiana Union Traction Company.

Kokomo, Marion & Western Traction Company.

Ohio Electric Railway Company.

Terre Haute, Indianapolis & Eastern Traction Company.

Toledo & Chicago Interurban Railway.

Western Ohio Railway.

Winona Interurban Railway.

Southeastern Ohio Railway, Light & Power Company.

The following lines have adopted Plan 2:

Chicago, Lake Shore & South Bend Railway.

Dayton & Troy Electric Railway.

Fort Wayne & Springfield Railway.

Springfield, Troy & Piqua Railway.

Toledo, Fostoria & Findlay Railway.

Toledo Urban & Interurban Railway.

The following lines have adopted Plan 3:

Columbus, Delaware & Marion Railway.

Indianapolis & Louisville Traction Company.

Indianapolis, Columbus & Southern Traction Company.

Louisville & Northern Railway & Light Company.

Marion, Bluffton & Eastern Traction Company.

The following lines have adopted Plan 1, effective with October, 1908, accounts, and will settle all interline balances, both ticket and freight, for October, 1908, and all subsequent months, under this plan:

Evansville Railways Company.

Fort Wayne & Wabash Valley Traction Company.

Indiana Union Traction Company.

Kokomo, Marion & Western Traction Company.

Ohio Electric Railway.

Southeastern Ohio Railway, Light & Power Company.

Terre Haute, Indianapolis & Eastern Traction Company.

Toledo & Chicago Interurban Railway.

Western Ohio Railway.

Winona Interurban Railway.

The other lines will adopt the plans specified as soon as the new mileage book is issued, but it is understood that all

accounts prior to October, 1908, must be settled under the old, and not the new, agreement.

Sections 3, 4 and 6 of the rules adopted by the Central Electric Accounting Conference on Feb. 25, 1908, for the settlement of interline ticket accounts and Sections 7, 8 and 9 of the rules for the settlement of interline freight accounts should be changed in accordance with the above agreement.

CLASSIFICATION OF ACCOUNTS

The new classifications of operating revenues, operating expenses and expenditures for road and equipment of electric railways, as adopted by the Interstate Commerce Commission and the Railroad Commissions of Ohio and Indiana, were fully discussed and a number of points were brought out indicating that additional information was needed covering certain items. On motion of S. C. Rogers, a committee was appointed to obtain from all members of the conference any questions that had been raised concerning the new classifications and to submit them to the committee on uniform classification of the American Street & Interurban Railway Accountants' Association, with a view of having the American association committee obtain a ruling from the Interstate Commerce Commission on such questions as might be raised, which, in the opinion of the committee, were of sufficient importance to require a ruling from that commission. All members were requested to forward to any member of this committee requests for information relative to the new classifications, and the committee will endeavor to obtain rulings and report at the next meeting of the conference. The following committee was appointed: S. C. Rogers, chairman (Mahoning & Shenango Railway & Light Company), L. T. Hixson, auditor (Terre Haute, Indianapolis & Eastern Traction Company), and R. H. Carpenter, auditor (Western Ohio Railway).

Owing to the important questions which will probably arise concerning the changes in systems of accounts for electric railways on Jan. 1, 1909, it was considered advisable to hold another meeting of the conference within the next two months, and the chairman was requested to arrange to call this meeting at such time and place as he deemed advisable. After discussing various other matters the meeting adjourned.

OBSERVATIONS OF A BELGIAN VISITOR

E. Uytborck, engineer, Belgian State Railway, has published in the last issue of the *Bulletin* of the International Railway Congress the notes made by him during a recent trip of inquiry to the United States. Mr. Uytborck's purpose was to investigate the electrically equipped steam lines here, partly on account of the proposed electrification of the Brussels-Antwerp line. After a detailed account of the New York Central, New Haven, West Shore, West Jersey & Seashore and other lines Mr. Uytborck presents the following conclusion:

On main-line railways it is advisable to use direct current at a tension of 650 volts or more if possible. This eliminates overhead conductors and allows the use of the third-rail, which alone is possible in freight yards, where there are machines for handling freight.

The use of high-tension, single-phase current must be reserved in the present state of electrical science to interurban lines extending over long distances and on which the traffic will always remain comparatively light.

The British Westinghouse Company has placed an order with an English firm for three triple-expansion engines, each of which will drive a 1000-kw generator in the power plant of the Buenos Ayres & Pacific Railway Company.

REHABILITATION PROGRESS OF CHICAGO RAILWAYS COMPANY

Under date of Nov. 15 the Chicago Railways Company made a report to Milton J. Foreman, chairman of the committee on local transportation of the City of Chicago, outlining the progress made to date in the rehabilitation of its lines in respect to track, rolling stock, buildings and electrical equipment.

The company accepted the city ordinance granting it a franchise in the streets on Jan. 29, 1908, and therefore 25 per cent of the three-year period allowed for immediate rehabilitation has elapsed. In approximately one-fourth of the time allowed for rehabilitation it has reconstructed 56 per cent of the cable tracks, replacing them with modern grooved rails laid in concrete. At the same time it has rebuilt 50 per cent of the electric tracks. A total of 74.4 miles of track has been built, including the 2-mile extension in Chicago Avenue. It is consequently more than 25 per cent in advance of the ordinance requirements in track rehabilitation. In respect to rolling stock, to buildings and other items, it is also well within the requirements of the ordinance, 50 per cent of this work having been completed.

A complete report of the track work done to Nov. 15, which practically marked the close of the season of track reconstruction, it being considered impracticable to lay concrete in cold weather, is as follows:

CABLE TRACK REBUILT TO NOV. 15	Miles of track
Blue Island Avenue, Twenty-second Street to Sixteenth Street	1.20
Halsted Street, Seventeenth Street to Fourteenth Street .....	.72
Monroe Street, Clark Street to Dearborn Street...	.07
Madison Street, Jefferson Avenue to Lincoln Street.	3.29
Clark Street, Illinois Street to Wrightwood Avenue.	5.62
Milwaukee Avenue, Desplaines Street to Robey Street	4.56
Blue Island Avenue, Harrison Street to Sixteenth Street	2.14
Van Buren Street, Clinton Street to Halsted Street..	.64
Clybourn Avenue, Division Street to Cooper Street..	3.92
Center Street and Lincoln Avenue, Clark Street to Wrightwood Avenue	2.42
Madison Street, Lincoln Avenue to Rockwell Street.	1.82
Madison Street, Rockwell Street to Fortieth Avenue.	.38
Adams Street, Dearborn Street to Franklin Street..	.28
Dearborn Street, Van Buren Street to Randolph Street .....	.43
Total miles of single track.....	
	27.49
Or 56 per cent of the 49 miles done on Nov. 15, 1908, leaving 44 per cent of the 49 miles to be done.	
ELECTRIC TRACK INSTALLED TO NOV. 15	
Fourteenth Street, Halsted Street to Wood Street...	2.52
Eighteenth Street, Wood Street to Sangamon Street.	2.18
Twenty-first Street, Laflin Street to Western Avenue	2.28
Ashland Avenue, Grand Avenue to Clybourn Place.	3.46
Division Street, Milwaukee Avenue to California Avenue	3.14
Lincoln Avenue, Wrightwood Avenue to Irving Park Boulevard	4.40
Division Street, Clark Street to Dearborn Avenue..	.15
Milwaukee Avenue, Fullerton Avenue to Powell Avenue	1.50
Madison Street, Clinton Street to Jefferson Street...	.15
Clark Street, Kinzie Street to Addison Avenue....	3.04
North Clark Street, Lawrence Avenue to Devon Avenue	4.07
Van Buren Street, Halsted Street to Kedzie Avenue.	6.04
Adams Street, Desplaines Street to Morgan Street..	.84

ELECTRIC LINES COMPLETED TO NOV. 15 Miles of track

Halsted Street, Van Buren Street to Lake Street...	1.24
Sangamon Street, Lake Street to Fulton Street...	.15
Clybourn Avenue, Cooper Street to Diversey Boulevard	1.57
Kedzie Avenue, Carroll Street to Twelfth Street...	2.90
Lincoln Avenue, Irving Park Boulevard to Western Avenue	2.33
Adams Street, Chicago River to State Street.....	.87
Dearborn Street, Chicago River to Polk Street.....	1.61
Ogden Avenue at Douglas Park.....	.11
Randolph Street, Halsted Street to Sangamon Street .....	.36

Or 50 per cent of the 90 miles done on Nov. 15, 1908, leaving 50 per cent of the 90 miles yet to do.

EXTENSIONS

Chicago Avenue, Fortieth Avenue to Forty-eighth Avenue, 2 miles or 6.2 per cent of the 32 miles.

SPECIAL WORK INSTALLED TO NOV. 15, 1908

- Lincoln, Wrightwood and Sheffield Avenues.
- Lincoln Avenue and C. M. & St. P. Railway.
- Blue Island Avenue and Twenty-first Street.
- Milwaukee and California Avenues.
- Lincoln and Southport Avenues.
- Ashland and Grand Avenues.
- Milwaukee and Elston Avenues.
- Clark Street and Evanston Avenue.
- Ashland Avenue and Chicago Avenue.
- Clark and Illinois Streets.
- Blue Island Avenue and Eighteenth Street.
- Blue Island Avenue and Taylor Street.
- Clark and Division Streets.
- Milwaukee and Noble Street.
- Clark Street and Belmont Avenue.
- Milwaukee Avenue and Division Street.
- Blue Island Avenue and Twelfth Street.
- Milwaukee and Chicago Avenues.
- Ashland Avenue and Division Street.
- California Avenue and Division Street.
- Lincoln, Ashland and Belmont Avenues.
- Seventeen crossovers.

The car shops between West End and Park Avenues, near Fortieth Avenue, consisting of carpenter and paint shops, a modern warehouse and additions to the present shops, are 65 per cent completed. In the carpenter shop the piers, the walls and the pits are all in and the transfer table is completed. The carpenter and paint shop is a fire-proof structure of pressed brick and concrete, with a general area of 340 ft. x 225 ft., and has a capacity of 125 cars. In the additions to the old shops at this locality all the walls and floors are constructed and the roof practically completed.

The car station at Twenty-fifth and Leavitt Streets, a fireproof structure of pressed brick and concrete, with an area of 344 ft. x 303 ft., is 85 per cent completed, and in another week or two will be ready for the reception of cars. The foundation, walls and roof are finished and the installation of floors, drainage and special track work will see the completion of this structure. It has a capacity of 142 cars of the new "pay-as-you-enter" type adopted by the Chicago Railways Company.

The new car station at the intersection of Lincoln, Sheffield and Wrightwood Avenues is 55 per cent completed. The foundations, walls and pit-walls all are done and the roof is three-fourths completed. This structure, built of brick and concrete, has an area of 280 ft. x 259 ft. and a capacity of 95 cars. The building work is completed on the Milwaukee Avenue and Cleaver Street substation, which has a 4000-kw capacity, and 95 per cent of the entire contract is finished, including 60 per cent of the electrical

work. The building is 50 ft. x 140 ft. in its dimensions.

About 50 per cent of the brick work on the machine shop at the city limits is completed and the foundations are now finished.

Work is advancing rapidly on all of these buildings. The company expects by early next season to build a car station at the city limits, one at Madison and Fortieth Avenues and one at Armitage Avenue. Considerable repair work has been accomplished at the last-named structures.

The Chicago Railways Company has installed 1,200,000 ft. of vitrified clay tile duct or about 227 miles. This has the necessary vaults and laterals for the transmission of electric current. It was estimated by the Board of Supervising Engineers that 446 miles of single duct would be required and about 50 per cent of this amount has been installed in 25 per cent of the time required.

The ducts have been installed wherever the old cable lines and electric lines have been rebuilt. A main feeder line has been constructed in Western Avenue. The Van Buren line of duct has been completed and also that in Adams and Dearborn Streets, the section of downtown Chicago that has been rehabilitated by the Chicago Railways Company this fall.

Seventy-five miles of trolley wire has been placed, the No. 0 having been changed to No. 00. It was estimated that it will require the rebuilding of approximately 170 miles of trolley to put the lines in perfect condition, so that 44 per cent of this work already has been accomplished.

Contracts have been closed for the laying of 126 miles of underground cable and work upon this portion of the rehabilitation will be pushed vigorously whenever the weather permits. Of the 150 miles of auxiliary cable that will be required 35 miles or 23 per cent have been laid.

The Madison Street line has been equipped with the new "pay-as-you-enter" cars adopted by the Chicago Railways Company. The remainder of the 650 cars of this type ordered by the company are being received at the rate of 25 a week and it will not be long before all of the principal lines will be supplied with them.

The new cars were received with great satisfaction on the part of the public. They are commodious, easy running and comfortable and have several new features that recommend them to patrons, including the wide seats and aisles, the heaters, the metal window sashes which add light and finish, the extra lighting equipment and the 7½-ft. platforms with ventilators.

The company is well within the requirements of its ordinance which stipulates that 225 new cars shall be placed in service on the streets within a year after the acceptance of the ordinance.

In addition to these new cars, which will be added to until they ultimately replace all those in present use, the company possesses the following double-truck cars all in good condition:

	Number	Length
St. Louis double-truck cars.....	205	40 ft.
Brill double-truck cars.....	5	40 ft.
C.U.T. double-truck cars	78	40 ft.
Buffalo double-truck cars.....	20	28 ft.
St. Louis double-truck cars.....	30	38 ft.
New St. Louis double-truck standard cars..	118	40 ft.
Rebuilt from combination grip car.....	1	40 ft.
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	457

In view of the progress of the rehabilitation that has been set forth the company feels confident that it will be able to complete all the work specified in its ordinance by next year.

HEAT ACCUMULATION IN STEAM ENGINEERING

BY L. A. BATTU

The first suggestion of storing energy by condensing and re-evaporating water in a chamber well lagged with non-conducting material was made in connection with the hot-water locomotive. Heat storage has also been proposed and in some cases employed in plants having variations of load by the use of auxiliary water drums on the boilers. These water drums, being connected to the steam main, were kept under pressure, and when the boilers had to meet sudden increases of load, the water stored up in the reservoir was injected direct into the boilers, thus greatly increasing the rate of evaporation.

Another device which has met with considerable success is the one patented by Professor Rateau and known as the steam regenerative accumulator. Professor Rateau has introduced into practice the idea of exhausting intermittent flux of steam in a heat storage reservoir, which he calls a steam regenerator. The steam when in contact with a mass of liquid will condense as long as the mass of water is not at a temperature equivalent to the steam temperature. It is obvious that the heat stored in the water will follow the same fluctuations as the pressure in the vessel containing the water; in other words, if the pressure in the regenerator decreases, the mass of water contained therein will give up heat in the shape of steam. If the pressure rises, the mass of water will absorb more heat. The difficulty to be overcome in such an apparatus consists in intermixing as thoroughly as possible the incoming steam with the mass of water without creating undue back pressure.

The first apparatus invented by Professor Rateau consisted of a large vertical tank containing cast-iron trays filled with water. The rapid interchange of temperature

for steam are placed on one side of each flue, adjacent to the other. In one element composed of two flues so perforated, the discharge of steam into the water between the flues will create (on account of the difference of density of shafts of water opposed to shafts of a mixture of water and steam) an active circulation around the flues and therefore will bring all of the liquid contained in the tank into contact with the incoming steam. In practice as many as 12 flues have been put in one tank and large tanks have also been divided into several decks, with the intention of increasing the contact of water and steam.

The apparatus thus roughly described was constructed in order to meet the severe conditions under which the apparatus has to work when connected with the exhaust of engines of the rolling mill or hoisting type. The flues are wide open at their lower end, being slotted in order to allow the water to flow freely when the exhaust steam comes suddenly in large volumes. Devices are placed on the apparatus to prevent the water from flowing back toward the main engine and flooding the cylinders, which might be the case if the regenerator was left inactive for a period sufficient to allow a vacuum to be created in the piping leading the exhaust steam to the regenerator. Traps are also adapted to maintain a constant water level in the regenerator and plates are located above the water level to prevent the steam discharging from the regenerator to entrain the water contained in the regenerator.

The diagram, Fig. 1, shows what close regulation can be obtained in the exhaust of an engine in a reversible mill which proceeds by starts and stops, working at widely different loads and at times being completely shut down. It will be seen that the pressure maintained is always slightly above atmospheric pressure, but never reaches 1.5 lb. above. It is interesting to note that between the lines

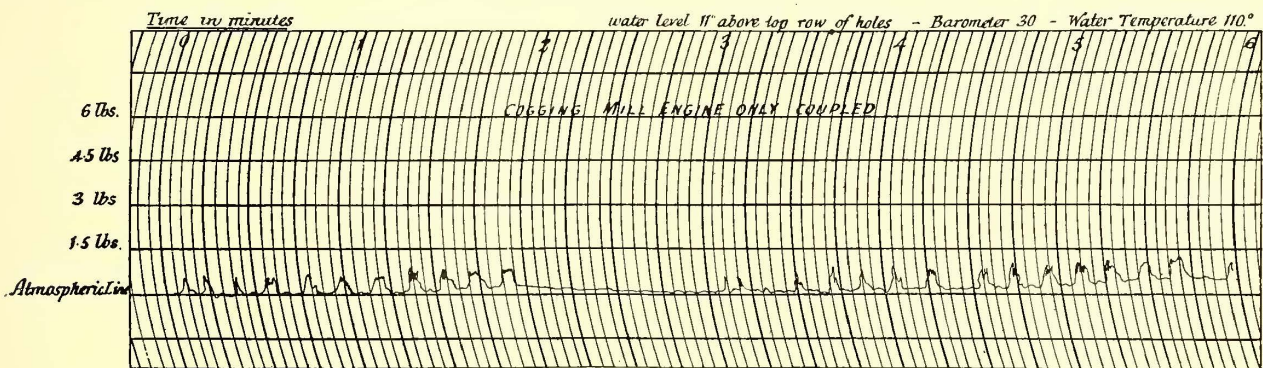


Fig 1.—Curve of Exhaust Pressure, Showing Close Regulation with Regenerative Accumulator

between the incoming steam and the water was due to the very large surface owing to the division of water in layers. This method is somewhat expensive, as the specific heat of pig iron is low compared to water, and the weight of material employed in ordinary practice is considerable.

In Europe plants have been built where as much as 400 tons of cast iron were fitted into a vertical receiver of large dimensions.

The second apparatus developed consists of a horizontal tank partially filled with water, in which flues direct the steam into the mass of water itself. These flues are arranged in pairs and bring the steam in contact with the water by means of small holes perforated in horizontal rows the entire length of the flues. These small openings

marked 2 and 3, the engine was entirely shut down and the pressure was only maintained through the accumulation of heat in the steam regenerator.

In mill practice regenerators are called upon to maintain the flux of steam constant during the mill cycle period, during which stops will never exceed one to one and one-half minutes.

The plants in America equipped with regenerators of this type are figured to carry the full load (in other words, to maintain the flux of steam constant) for periods of two minutes, with a range of pressure not to exceed 3 lb.

The first installation in America, at the International Harvester Company's plant, is equipped with a steam regenerator containing some 75 tons of water and can maintain a constant flux of steam at the rate of 22,500 lb. per hour for over five minutes. During this period no steam

*Abstract of a paper read at the October meeting of the New York Railroad Club.

whatsoever is admitted to the heat reservoir. This regenerator has a capacity sufficient to supply steam to two turbo-units of 500 kw each.

The plant equipped for the American Sheet & Tin Plate Company at Vandergrift contains 40 tons of water and can deliver for periods of at least two minutes a constant flux of steam at the rate of 20,000 lb. per hour. In the case of both the International Harvester and the Vandergrift regenerators, the pressure in the steam regenerator is maintained between atmospheric pressure absolute and 3 lb. above. The maximum pressure is regulated by means of a relief valve, which opens at a predetermined pressure.

A number of regenerators have been installed in European mines. The regenerator is placed under the ground level so that drains from all the engines run by gravity into the heat reservoir and flow out through the water trap. The regenerator is lagged with heat insulating material to prevent condensation taking place too rapidly in the apparatus. The largest amount of water of condensation which flows through the water trap of the regenerator is condensed in the primary engines, and a small amount is due to radiation in the piping and regenerator itself. This radiation has never been found to be more than 1 per cent or 2 per cent. If the regenerator surface and the piping

two losses are practically proportional to the specific weight of the fluid and therefore are smaller when the specific volume of the steam is greater.

On account of the relative advantage obtained in utilizing high-pressure reciprocating engines and low-pressure steam turbines, some remarkable results can be reached. To obtain these results an intermediary piece of apparatus must be placed between the reciprocating engine and the turbine, especially in the case where the reciprocating engines work intermittently. This link is the steam regenerator. In the case of reversing engines, mill engines and steam hammers, the fluctuation of the steam supply is such that no turbine could be run without the use of the regenerator equipment.

In practice, regenerators are built in such a way as to be able to handle from one to three minutes complete interruptions of the supply of exhaust steam; in other words, the heat storage device is sufficient to supply enough steam to the turbines to take care of their full load during a period of one to three minutes. If the mill engine or hoisting engine is shut down for periods of longer than the regenerator is capable of handling, an automatic reducing valve will open when the pressure in the regenerator reaches atmospheric pressure, or any predetermined pressure, and will furnish steam direct from the boilers. This live steam is obtained at practically no expense, as after two or three minutes the safety valves of the boilers would blow and the steam would go to waste in any event.

In plants where the engines have to work under steady loads the function of the steam regenerator is somewhat reduced. In case the engines drive electric generators in parallel, with the electric generators driven by the turbine, it is possible to do without a steam regenerator. This, however, will introduce a strain on the turbine governor, which will be subjected to the synchronism of the engine exhaust. This could be remedied by the use of a very small

heat storage equipment. Furthermore, the slow action of the regenerator will allow the reducing valve equipment to work far better than in a case where, no regenerator being placed between the main engine and the low-pressure turbine, the steam supply would abruptly cease.

In case of engines working in parallel it is advisable to run the low-pressure turbine, although electrically geared to the main engine, with its own independent governor, for the simple reason that if the switchboard disconnects the turbine, the turbine will either run away or a speed-limit device will act and completely stop the turbine. The plant has then to be started anew.

In cases where the main engines drive electric generators which do not run in parallel with the low-pressure turbine electric generators, steam regenerators are of great value. They assure to a certain extent the independence of action of the low-pressure turbine, which is then able to take varying loads without having each time to call on the reducing valve to admit live steam immediately.

The flywheel effect of a heat storage device between the engines and the low-pressure turbines assures considerable elasticity in running the plant and will also show an economy in live steam admission. The regenerator also acts as a perfect separator; the steam is forced through water

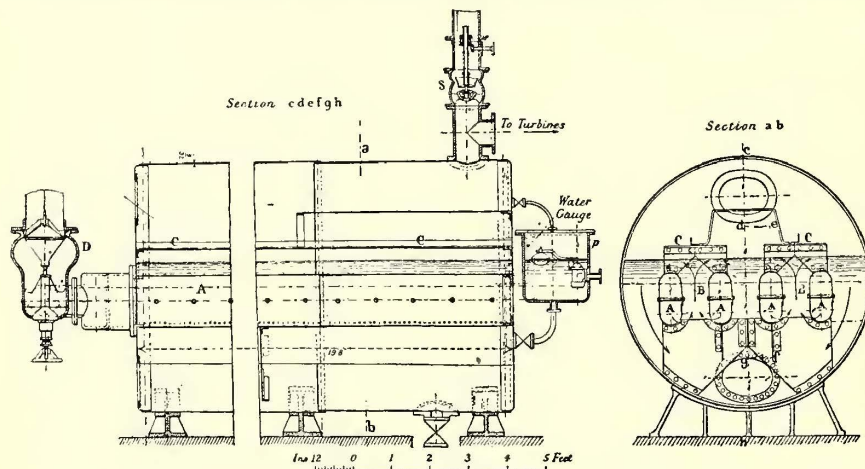


Fig. 2—Sections through Rateau Regenerative Accumulator

are protected by heat insulating material, the above quantity can be reduced one-half.

It is a well-known fact that reciprocating engines use steam at high pressure to better advantage and that turbines show a great increase in economy when compared with reciprocating engines on steam at low pressure, especially when the turbines utilize steam at pressures in the neighborhood of 15 lb. absolute. It is easy to understand why reciprocating engines do not show as great economy as turbines when utilizing steam at low pressure. In reciprocating engines, where steam expands in a cylinder of relatively small volume, the losses by friction are considerable and do not allow a complete expansion of the steam. The turbine, on the other hand, allows the most perfect use of low-pressure steam and permits the utilization of the vacuum to the best possible advantage. With the considerable speed of the flow of steam in a turbine and the immense volumes which can be handled by it, it is possible to build a turbine of small size, capable of utilizing 100,000 lb. of steam per hour. Turbines have an increased thermic efficiency when the pressure decreases. This is due to the fact that the losses from friction on account of the wheels or drums rubbing in the steam and on account of the leakage between the rotary and stationary parts is greatly diminished. These

and is then supplied to the turbine as dry saturated steam.

A Ball & Wood engine, when indicating 1103 hp, with steam at 175 lb., dry saturated, and free atmospheric exhaust, shows a steam consumption of 17.96 lb. per brake hp under careful test. Suppose that an engine having the above-named steam economy was combined with a low-pressure turbine working between atmospheric pressure absolute and a vacuum of 28½ in. (1½ in. back pressure absolute). The theoretical steam consumption of the turbine working under the above-named conditions is 13.9 lb. per hp-hour. A low-pressure turbine can be built with an efficiency of 75 per cent. Assuming this efficiency for the turbine, the steam consumption per hp-hour will be 18.5 lb. The combined steam consumption of the engine and the turbine will, under these conditions, give the hp-hour for 9.10 lb. The thermic efficiency of the plant would be increased by the use of a surface condenser returning some 8 per cent of the heat to the boilers.

In plants where engines are now running non-condensing, the use of low-pressure turbines running compound with the engines, will always show a great improvement in steam economy. The range of economy obtained by the use of low-pressure turbines runs from 200 per cent in the case of steam hammers, reversible mills, etc., to from 10 per cent to 15 per cent with reciprocating engines of the most perfected type, under favorable load conditions.

The following is a brief summary of the plants equipped with steam regenerators: The International Harvester plant at South Chicago was built two years ago and has been in continuous operation ever since. This plant utilizes exhaust steam delivered by a reversible mill engine. The turbine drives direct-connected d.c. dynamos, 250 volts, capacity 500 kw at a speed of 1500 r.p.m. The rolling mill engine, when working 24 hours a day, averages 800 hp on the rolls. When the low-pressure turbine plant using the exhaust of this mill is completed, more than twice this amount will be available at the switchboard.

There has also been equipped for the American Sheet & Tin Plate Company a plant at the Vandergrift Works. This plant was put in operation some weeks ago. C. H. Smoot, chief engineer of the Rateau Steam Regenerator Company, designed the plants at South Chicago and Vandergrift. The turbine designed by him for the Vandergrift plant was built by the Ball & Wood Company, Elizabeth, and is constructed with the view of assuring high efficiency and simple operation. The dynamo is a 500-kw d.c. machine, 250 volts, running at the speed of 1500 r.p.m. It commutates as well as any well-known type of slow-speed machine and no special care is necessary to ensure this commutation.

In Europe the installations of steam regenerators have reached above 120,000 hp and the prospects are good for establishing many new plants.

The regulating of superheat where the steam consumption fluctuates considerably is done in the Jankowsky system of the Aktiengesellschaft für Maschinenbau of Brünn by using superheating tubes, which are inserted for longer or shorter distances into the boiler. The steam from them is divided, one part going directly to the engine and the other, which is the regulated portion, passing through a cooling system, where some of its heat is absorbed and delivered to the boiler. The subsequent mixture of the two parts furnishes steam with less marked fluctuations of temperature than usual under the same conditions of load and is said to increase the output of the boilers from 6 per cent to 8 per cent.

MONTHLY MEETING OF THE ELECTRIC RAILWAY SHOP FOREMEN'S ASSOCIATION

The monthly meeting of the Electric Railway Shop Foremen's Association of the Public Service Railway Company was held at the Plank Road shops on Thursday afternoon, Nov. 19. At this meeting the following officers were elected for the ensuing year: President, John Murphy, foreman of the South Orange shop; vice-president, Henry Dupras, foreman of the Milltown shop; secretary, W. D. Bower, Elizabeth shop; treasurer, H. W. Wightman, South Orange shop. It was decided to hold the monthly meeting hereafter on the third Friday afternoon of every month to give the foremen more time to devote to the meetings and to make attendance more convenient for those who live at considerable distances from the meeting place. The next session will be held on Dec. 18.

The subject for the monthly meeting was to have been a consideration of the report of the committee on maintenance of electric equipment as presented on Oct. 14 at Atlantic City at the convention of the American Street & Interurban Railway Association. President Ricker read the portion relating to carbon brushes, but the rest of the report was postponed until the December meeting as R. E. Danforth, general manager of the Public Service Railway Company, was on hand to address the members.

Mr. Danforth gave a very interesting talk in which he presented the maintenance cost per 1000 car-miles of the same kinds of equipment on different divisions. He pointed out that, owing to the different classes of apparatus and operating conditions in use throughout the system, it would not be fair in all cases to expect the costs to be alike. Nevertheless, there were certain instances where the cost of maintenance of a particular item was double or even triple the figure secured in some other car house, although the equipment and service were not materially different. The variations in cost were often of a kind which could be eliminated by better inspection and stronger insistence that the transportation, track and line departments obviate defects for which they were responsible.

Beginning with armatures and field coil costs, Mr. Danforth believed the greater trouble which some car houses had was caused by using on the same car motors with fields of unequal strength, thus making one motor take more than its share of the load. It was also important to have the resistances properly balanced. Controller troubles frequently were due either to the improper care of the controller fingers and contactors or to the carelessness of motormen. More attention should be paid to the moving parts of a controller and a closer tally kept to check up particular motormen. As troubles with motor bearings came from lack of lubrication, it was well to bear in mind that a few drops of oil cost a great deal less than new bearings, besides preventing the delays resulting from hot journals.

He had found the cost of trolley wheel maintenance fairly equal throughout the system except where track construction and high-speed operation tended to decrease the life of the wheels. In one case, where the trolley poles had been frequently replaced, it was found that the trouble had been due to a poor overhead switch at the car house. Yet this defect could have been quickly remedied by calling it to the attention of the line department. In two of the shops the cost of gear cases was so much lower than elsewhere that he recommended a thorough study of the methods used by these shops to obtain their excellent results.

Speaking about car-body details, Mr. Danforth said that the large number of cars recently converted or being converted to the pay-as-you-enter service made it rather difficult to compare maintenance costs on this item. He gave some figures, however, on comparative fender and headlight charges and suggested that more attention should be given to the fare-register fittings and handles when inspecting cars. Loose handles should not be permitted and it would not be a bad idea to test the register to see whether it rings without much effort. It should be remembered that a conductor must ring the register a great many times during the day and will not be over-anxious to do so if it is hard work. Some cars also appeared to have an abnormal number of broken windows and it would be worth while to find out whether the trouble was not due to carelessness of the crew in handling the sash.

Considering the storage and independent air-brake systems, he had found that on the same initial charge a storage brake of one car could be used for many more applications than another. This was due to leakages in the piping which should have been remedied in the repair shop. The independent air-brake equipment costs also showed considerable variations. To get a better idea of this apparatus he strongly recommended that the members of the association should visit the shop after the meeting to see what a delicate apparatus an air compressor is and how it is repaired.

Brake-shoe costs were running fairly low on the different divisions, but car wheels were giving more trouble than before. Considerable flange breakage would be avoided if the foremen made a closer study of the track on their divisions and reported their findings to the maintenance of way engineer. He was sure that such interdepartment criticism if made in the friendly spirit of mutual helpfulness would be appreciated and result in better service throughout the system.

Another point brought up was that some divisions ordered much more material per car than others. In some cases this was the result of waiting until the last moment and then ordering material for more than a month's reasonable needs, excessive use of certain parts of equipment or perhaps failure to secure the proper credits for returned material. Remedying the last point would make it possible to check up the requisitions on a more reasonable basis.

Some interesting figures were given as to the number of men employed in different shops for certain purposes. In one shop 34 motors are cared for by one man and in another 68 motors, while the general average throughout the system is 45 motors. Similarly, 87 controllers are maintained by an individual in one shop as against 189 in another, while the general average throughout the system is 100. This brought out not only the question of comparative efficiency of the men, but also the fact that in smaller shops the time for certain classes cannot be so economically distributed as in the main shops. Figures were also given of the number of pull-ins and their causes. Of 246 pull-ins, 47 were ascribed to motor trouble, 23 to controllers, 34 to brakes and 20 to hot journals.

In conclusion, Mr. Danforth pointed out that the severe ordeal of winter operation was close at hand and now was the time for the foremen to get the scrapers, motors and other apparatus in the best possible condition. President Rickert in the name of the association thanked Mr. Danforth for his talk and said that he was sure the sentiment of the men was that rather than seek excuses they would make honest endeavors to remedy the defects which had been pointed out to them.

At the suggestion of Mr. Danforth, Alfred Green, lubrication expert of the Galena Signal Oil Company, will give a talk at the next meeting on methods for reducing the cost of lubrication. It was further announced that a representative of the American Street & Interurban Railway Association will address this meeting also.

HEARINGS ON JOINT FARES AND THROUGH ROUTES IN NEW YORK

The Public Service Commission of New York, First District, took up on Nov. 12 the orders requiring Frederick W. Whitridge, receiver of the Third Avenue Railroad, and the Central Park, North & East River Railroad to establish through routes and joint rates.

Thomas W. Tannock, of Marwick, Mitchell & Company, accountants, who made an examination of the condition of the Third Avenue Railroad, was called as a witness. He testified regarding the report made by the firm and the sources of the information contained therein. The report was made for the committee representing holders of the 4 per cent consolidated mortgage bonds. The records of the New York City Railway for the years ended June 30, 1905, 1906 and 1907, and copies of the reports to the Railroad Commissioners for the fiscal years 1903 and 1904 were used in the investigation. The average fare per passenger for the years 1905, 1906 and 1907 was taken from the records of the New York City Railway and for 1903 from the Railroad Commissioners' report. The figures of cost for maintenance of way, equipment and power plant during the years ended June 30, 1905, 1906 and 1907, were prorated in proportion to the car mileage. The figures as to the average fare per passenger for 1903 and 1904 were computed by taking the gross receipts for cash fares and ticket fares and dividing the sum by the total of all passengers carried. Some of the fares were 4-cent fares and some 5-cent fares, the 4-cent fares being those of passengers who were received by transfer from another road.

William H. Miller, formerly confidential clerk for the superintendent of the Third Avenue Railroad, testified regarding the equipment of the road for electrical operation.

TESTIMONY OF MR. WHITRIDGE

Mr. Whitridge, who was called as a witness, testified that he took possession of the property on Jan. 11. At that time, Mr. Whitridge said, the Third Avenue road "was giving transfers to everybody and took them from everybody. The transfer conditions at that time appeared to me to be perfectly ridiculous. I did not know much about it, but from what I saw it seemed to me that it was an impossible situation, and for the purpose of finding out what you could do with transfers, I asked one of my assistants, R. W. Kelley, to see how long he could ride and how far he could go on the system by using transfers. He rode from 10:30 a.m. until about 12 o'clock at night, up and down, back and across town and down and uptown at a cost of 10 cents." A statement regarding this journey was filed with the United States Circuit Court when Mr. Whitridge asked permission to abolish transfers with the Metropolitan Street Railway.

Mr. Whitridge said he thought that the laxity in the use of transfers was due to various conditions, including faults in the system and faults of the conductors in not taking up the transfers or in giving them improperly. He supposed that when the city was deluged with transfers a certain amount of carelessness was necessarily attendant upon the use of them.

The motive in continuing transfers between the different

railroads comprised in the Third Avenue system was to furnish thereby to the Third Avenue Railroad or the roads that, loosely speaking, are in its control the greatest possible facilities for getting about the city and the most expeditious service and the best cars, with the notion that people "who had heretofore been giving their nickels to the Metropolitan people might be induced to give them to us."

Mr. Whitridge was asked about the transfer system and he said that the whole theory and practice of transfers was more or less of a puzzle. He knew that such systems of transfers as outlined in Mr. Kelley's report, to which reference had been made, were not only ridiculous, but necessarily unprofitable. He added: "I know, or think I know, that to a certain extent transfers are desirable and necessary and profitable, and that if you do not have them your earnings will go down and you will not make any money, which is the main object which we have at heart. Exactly how they operate in any particular case I do not know except by experiment. And in addition to that I do not know anybody else who knows enough about it to say positively what is going to happen when you add on or when you take off a transfer."

Mr. Whitridge presented the following statement of the Third Avenue road:

Oct. 12, 1907, to April 10, 1908.	
Revenue passengers.....	19,852,054
Transfer passengers.....	9,007,755
Total passengers.....	28,859,809
Average fare per passenger.....	\$0.0342
Per cent of revenue passengers to total passengers.....	.6879
Per cent of transfer passengers to total passengers.....	.3121
April 11 to Oct. 10, 1908, inclusive.	
Revenue passengers.....	23,498,914
Transfer passengers.....	3,071,534
Total number of passengers.....	26,570,448
Average fare per passenger.....	\$0.0441
Per cent of revenue passengers to total passengers.....	.8845
Per cent of transfer passengers to total passengers.....	.1155

In speaking about the improvement in earnings, Mr. Whitridge said that the second period was in the summer time, when the earnings of the road necessarily were much greater than in the other half of the year. The company had practically new cars and a summer in which, it was found by experience, large numbers of people rode in the cars in the evening as people better off in the world rode in automobiles.

PROFITABLENESS OF THE BUSINESS

Discussing the profitableness of the business, Mr. Whitridge said: "When you come to the question of how much these things cost, we have not undertaken to keep a statistical bureau; we have been engaged, as I have written you, in putting this property in order, and I have not undertaken to make any close estimate of net earnings, because net earnings that are not represented by money in pocket do not appear and there is not any money in bank except what is spent four or five times over or contracted to be spent. Therefore I cannot and I would not enter into any very precise calculations as to whether or not it costs somebody to carry people on the Kingsbridge road a tenth of a mill of some other number of miles or not. There is a great deal of humbug about that sort of calculation."

John M. Bowers, counsel for the Central Trust Company, of New York, said he understood that it was the opinion of Mr. Whitridge that the only two factors which affected this increase of the fare per passenger were those of more efficient and cleanly operation and the cutting off of universal transfers. Mr. Whitridge replied "undoubtedly; there are no other existing causes that I am aware of unless there has been created a general benevolence to the Third Avenue Railroad."

In speaking about the loss of fares, Mr. Whitridge said that a short investigation which he made himself convinced

him that there were about 6 per cent or 7 per cent of the passengers on the cars who did not pay, or from whom the company did not get fares. On the whole the chances were that the public steal rather more than the conductors. He added: "We are trying to get a better class of men, trying to get married men, men who have a stake in the country. We think that that has diminished it somewhat, and we attend very punctually to every kind of complaint that is made."

Mr. Whitridge said that he had had 50 or 60 replies from bondholders in answer to his letter asking them to ride on the road and to suggest what could be done to make it better and to keep their eyes on the conductors. He thought that the situation had improved and that much improvement would follow the introduction of the pay-as-you-enter cars. Mr. Whitridge said that to a certain extent the public did steal rides deliberately in the case of a very crowded car; a great many people who traveled could not pay fares and it was physically impossible for the conductor to get them.

The following statement of the income account of the Third Avenue Railroad from Jan. 12 to Sept. 30, 1908, was presented:

Earnings:	
Cash fares.....	\$1,544,106.80
Ticket fares.....	34,304.85
Mail earnings.....	1,808.39
Rent.....	19,287.61
Advertising.....	18,937.46
Sale of power.....	517,189.50
Rental of cars.....	95,632.00
Miscellaneous.....	36.85
Total.....	\$2,231,303.46
Operating expenses:	
Maintenance of way.....	\$154,520.01
Maintenance of equipment.....	497,765.82
Operation of power plant.....	314,719.91
Transportation.....	423,668.04
Injuries and damages.....	59,171.08
General expenses.....	80,133.90
Total.....	\$1,529,978.76
Deductions:	
Taxes, real estate.....	\$49,236.29
Taxes, earnings, State.....	16,243.37
Taxes, car license.....	2,881.72
Extraordinary expenditures for improvements.....	89,848.85
Total.....	\$158,210.23
Surplus for the above period.....	\$543,114.47

In speaking of the extraordinary expenditures, Mr. Whitridge said they represented an accumulation of things that ought to have been included in the proper operation of the railroad during the period of time prior to his taking possession of the property.

INJURIES AND DAMAGES

From the foregoing the following estimated deductions were made:

Injuries and damages, 10 per cent on gross earnings less sale of power, \$1,714,113.96.....	\$171,411.39
Deducting those charged.....	59,171.08
Balance.....	\$112,240.31

This estimated deduction on account of injuries and damages was based on reports obtained from the Metropolitan system regarding expenses of the Third Avenue road for several years prior to the appointment of Mr. Whitridge as receiver. These figures were as follows:

Year ended	Gross earnings.	Settlements.	Expenses.	Total.	Ratio, total expenses to gross earnings.
June 30.					
1903...	\$2,189,474.66	\$158,727.44	\$108,520.36	\$267,247.80	12.21
1904...	2,201,417.06	203,000.24	126,463.43	329,463.67	14.97
1905...	2,164,175.55	164,908.33	104,007.68	268,916.01	12.42
1906...	2,243,033.83	161,463.01	84,735.79	246,198.80	10.97
1907...	2,082,865.79	221,813.58	132,821.97	354,635.55	17.03

Mr. Bowers said that the large amount of damages and expenses in the 1907 fiscal year was probably occasioned largely by the fact that more trial courts were in operation at that time.

Mr. Whitridge also included in his statement a deduction on account of depreciation of 10 per cent on gross earnings. He stated that this figure was determined rather arbitrarily. It was an average estimate of what was supposed to be the life of the various constituent elements of the railroad. Mr. Whitridge stated that he had had considerable experience with the management of railroads and he had been making inquiries on that subject for the last 20 years, and had made particular inquiries in respect to the life of cars and the use of rails and life of rails in New York City.

Mr. Whitridge stated that this expenditure would be in addition to proper maintenance charges. Respecting an estimate of \$43,333.30 for salaries of officers, accountants, legal expenses, etc., Mr. Whitridge said that he based that estimate "on the fact that when I get through being a receiver who is paid nothing they will have to have a president who is paid a good deal. I based that on the fact that now the Public Service Commission requires a large force to write innumerable letters, make innumerable reports and they raise innumerable questions which require the retaining of learned counsel, and I have, for instance, a force of accountants at work now engaged in getting up answers to the many conundrums which the commission has set before us."

In speaking of the innumerable orders to which he referred, Mr. Whitridge added: "Most of these I have been able to deal with myself. The circular of 27 or 28 closely printed pages giving instructions how to formulate the tariffs for posting upon the Third Avenue Railroad was one that I first looked at. As I read the book I could not understand what on earth you were driving at, because if there is any one thing which anybody or everybody knows here it is that the tariff on the Third Avenue Railroad is 5 cents. When it came to your pamphlet of 100 and odd printed pages and 70 odd printed pages as to the annual report, my auditor immediately resigned as soon as he looked through it. I also looked through it and concluded that I did not know anything about it."

Deducting the foregoing items left a net balance from the income account of \$216,129.47 with no deduction on account of the franchise tax. Mr. Whitridge added that the maintenance of equipment expenditures were larger than would have been necessary if the plant had been in proper condition. He said that an accumulated depreciation of seven or eight years had to be made up in reference to the cars and track. The following statement was submitted showing the charges to operating expenses for maintenance of way and equipment by the Third Avenue Railroad:

Year ended June 30.	1901.	1902.	1903.	*1904.
Maintenance way and structures	\$59,591.29	\$136,451.97	\$147,279.40	\$109,571.68
Maintenance, equipment	213,658.37	232,609.82	156,879.04	128,638.29
*For the 10 months ending April 30, 1904.				

CARS ORDERED

Mr. Whitridge, when recalled for examination on Nov. 13, said he had incurred an obligation for the purchase of 150 pay-as-you-enter cars at a cost of, say, \$4,500 apiece. He had made a tentative obligation for the purchase of 200 open cars for next season of a new design.

In speaking of the condition of the Forty-second Street, Manhattanville & St. Nicholas Avenue Railroad, Mr. Whitridge said that complaints had been received from the commission and from residents of upper Broadway regarding noise. The engineers of the company had informed Mr. Whitridge that it had now been discovered that at the time the subway was built it apparently was not filled in properly; the surface cars ran over the subway, which

acted as a sounding board, and on top of that there were numerous cavities which intensified the sound.

LOSS OF FARES

In speaking further regarding the loss of fares, Mr. Whitridge said that the first step necessary to reduce the loss was to try and get a better set of men and bring about a better spirit among the employees. When he took control of the Third Avenue road New York City was saturated through the newspapers and politicians, he said, with the notion that everybody that had anything to do with the street railroad was a thief, and he thought the smaller employees reading this stuff rather got the notion that there was no particular reason why they should not join the procession; the first thing to do was to get a better personnel; the second was to get more cars, so that the crowding which made the collection of fares impossible at times with the best of will in the world should be done away with; the third was to introduce the pay-as-you-enter cars, on which he was proposing to have fare boxes, which, he believed, would reduce the loss of fares from the public to a minimum. If his way could be seen clear the same arrangement would be introduced on the open cars next summer.

Mr. Whitridge defined a through route as "a route by which somebody can get on a car and go through to some other point."

Mr. Whitridge stated his objections to the order of the commission providing for the establishment of through routes and joint rates with the Central Park, North & East River Railroad. At the hearing on Nov. 18 Mr. Whitridge was recalled for further examination and made the following statement:

OBJECTIONS TO ORDER

At the close of my testimony at the last hearing I was called to the telephone and my answer to your question was not clear or complete and with your permission I recapitulate it.

My objection to the order in the Metropolitan case compelling transfers between the Fifty-ninth Street road and all the Metropolitan lines to and from points north of Thirty-fourth Street and south of 116th Street is that it undertakes to apply to a crowded city the zone system in use in rural communities; as, for instance, between Providence and Woonsocket, and I think the least imagination should enable any one to see that the zone system cannot co-exist in a city with a single straight 5-cent fare.

The Third Avenue order, which declares a through route from any point on the Forty-second Street line across Fifty-ninth Street, down the Third Avenue line, is objectionable: First, because it is unnecessary and inequitable on top of the order in the Metropolitan case. There is no considerable number of people to be served by it who would not be accommodated by the Metropolitan order. Second, the order is apparently a step toward the restoration of universal transfers, which I believe to be ruinous. I understand that the petitioners in this case openly avow that object. Third, the order tends to abolish competition, which is necessary to secure the best service in this city. My question to the commission is a perfectly fair one, and the members of the commission ought, I think, to tell me whether they think I am justified—until they have either dismissed the petition in this case, or in some other way disavowed their intention of abolishing competition and harnessing the Third Avenue and the Metropolitan together through the medium of Fifty-ninth Street—in arranging to spend large sums of money for the equipment with motors of horse-car lines which, after they are developed as valuable adjuncts of the Third Avenue road, are to be turned over equally for the use of the Metropolitan passengers. Fourth, the order itself, as a precedent, is totally impracticable. Here is a petition, disingenuous on its face, presented by some association for a service which, in view of the other orders of the commission, is entirely unnecessary. I am bound to assume, if the commission grants that petition, that it will

do as much for any other petitioner. I have, therefore, had calculated the number of possible "through routes" which can be made with the railroads and crossings on this island, and my engineers tell me that it is, by permutation, 8,407,100, and, by combination, 4,203,550. I am ready to throw off the millions and the hundreds of thousands, but it must be obvious that if this order is granted, a precedent will be made requiring an impossible number of similar petitions to be granted.

If I may say so, the solution of the problem which the commission is trying to deal with is a ticket system, by which passengers pay for the distance they ride. The objections to such a system in this city are these: The whole population are habituated to a single 5-cent fare, the cars are built for it, we have not the currency for anything else, and I do not believe that our public would stand the amount of regulating necessary to put a ticket system into operation. This being true, I think it is plain that the public will best be served by allowing the railroads to experiment with transfers and to compete among themselves for the custom of the public. With this in mind I shall, as I said to you the other day, within 30 days have on the Third Avenue Railroad what I believe to be the most efficient, comfortable and relatively the cheapest street car service in the world, except possibly in Chicago and the Twin Cities, which I have not seen lately. I consider that the action of the commission in making these orders has been to play absolutely into the hands of the Metropolitan and has destroyed for the present the chance of getting another cross-town line for the Third Avenue. If the course indicated by those orders is persisted in, not only will such improvements as I have above referred to be stopped, but the last new money which will go into the surface roads of this city for many a long year will be the proceeds of the receiver's certificates we are now expending in rehabilitating the existing lines.

EXTENSIONS IN MILWAUKEE

The Milwaukee Electric Railway & Light Company is planning next spring to take up the construction of its extension from St. Martins to Burlington, a distance of some 20 miles. The cars of this line will use the existing track of the East Troy line to St. Martins, from which point it will run southwest through Waterford and Rochester to Burlington. It will form part of a vast system projected by Mr. Beggs with Milwaukee as a center and radiating through six or seven counties west and southwest of that city.

The company's Watertown single-phase extension from Waukesha Beach, which has been described in these columns, has enjoyed a successful summer business. Through interurban cars are now being run to Watertown from Milwaukee every two hours. The one-way fare is \$1.10 and round-trip tickets are sold for \$1.75. The company has recently had some resurfacing gangs at work on this line putting it in shape for the winter. With its long stretches of straight track, uniform poles and carefully maintained roadbed the Watertown line affords a very attractive ride not only for the seeker after recreation and the regular traveler, but also to the engineer who can appreciate the excellence of the work conducted on this new interurban line.

A concession has been granted by the Government of Switzerland for the construction and operation of an electric railway from Gletsch to Disentis. The line will be of meter gage, using the overhead trolley system, and is 60 km in length. The cost is estimated at \$2,800,000. Of this amount \$296,610 will be spent for rails and permanent-way materials, \$317,000 for rolling stock and \$211,000 on buildings.

THE REASONS FOR INCREASED FARES ON MASSACHUSETTS STREET RAILWAYS—I.

"The ELECTRIC RAILWAY JOURNAL is justified in raising a red flag of warning against the excessive service permitted by existing fare and transfer systems in most localities," was remarked recently by a prominent and able executive in the street railway industry. When this paper began a study of the present situation in Massachusetts it was with the definite belief that the changes in fares which have been worked out in this New England State are but forerunners of advances that economic conditions necessitate in other parts of the country. This understanding has been strengthened greatly by investigation of the sound reasons why extraordinary steps have been taken in one State to produce a condition of profitable operation.

The laws of Massachusetts permit more accurate analysis of the financial affairs of street railways over a reasonable period of years than is possible in other States, except to those intimately connected with the control of properties. The laws go further than that, however; if they could point out the facts but afford no remedy, they would give the companies no protection. The laws permit recognition of the facts and, in the light of the situation they reveal, enable companies, unless their finances are so badly involved as to be wholly past remedy without receivership, to take steps to save themselves. These conditions, combined with a slow increase of population in Massachusetts and the construction of mileage that is probably excessive per unit of population, have produced the present fare situation in the State.

DIVIDENDS

At the close of the fiscal year ended Sept. 30, 1907, the position of Massachusetts street railways respecting earnings on capital stock, as shown by reports on file with the Railroad Commission, was as follows:

	Capital stock.	Net deficit to Sept. 30, 1907.	Net surplus.	Net surplus, current year.
Number of roads paying no dividend.....47	\$9,838,075	\$418,849.50	.....	\$11,627.32
Number of roads paying dividend of 2 per cent. 5	1,920,000	.....	\$70,740.95	.....
Number of roads paying dividend of 3 per cent. 2	1,162,000	.....	76,341.05	.....
Number of roads paying dividend of 4 per cent. 2	7,822,200	.....	61,214.44	.....
Number of roads paying dividend of 5 per cent. 6	11,513,200	.....	147,675.98	.....
Number of roads paying dividend of 6 per cent.10	21,557,000	.....	930,599.54	.....
Number of roads paying dividend of 7 per cent. 2	1,280,000	.....	84,939.34	.....
Number of roads paying dividend of 8 per cent. 8	20,469,550	.....	1,957,442.74	.....
Number of roads paying dividend of 10 per cent. 1	297,700	9,915.93	.....	.....

These figures are not presented as new, but because they represent accurately the conditions which make increased revenues desirable from every point of view.

The benefits of the operation of these 83 roads accrued largely to the communities served. As is shown, 47 roads, or 56.6 per cent of the lines operating in the State, paid no dividends. The average dividend per road was 2.4 per cent. Whether the rate of reasonable return on an investment is accepted as 6, 8, 10 or 12 per cent, it is clear that a property which pays a dividend of but 2.4 per cent in one year must yield much more during a later year if the discrepancy between that point and the percentage of fair return is to be made up; that is, if a fair return is assumed to be, say, 8 per cent, the investor would be entitled to dividends aggregating 16 per cent in two years, but if he received only 2.4 per cent in one year the return in the following year would have to be 13.6 per cent.

Similar figures giving the results during the fiscal year ended Sept. 30, 1908, are not yet available for publication.

TRACKAGE OF ELECTRIC AND STEAM ROADS

The extent of steam railroad and street railway development in Massachusetts is shown by the following figures:

Area of Massachusetts, square miles.....	8,177 Miles.
Main line and branches, steam railroad.....	2,105
Second, third and fourth tracks, etc., steam railroad.....	2,385
Miles of lines, street railway.....	2,219
Miles of second track, siding, etc., street railway.....	556
Total trackage, steam and street.....	7,266

It is thus shown that for every square mile of area there is 0.89 mile of either steam or street railway track.

INCREASES IN COSTS OF LABOR AND MATERIALS

If the argument for increased fares rested wholly on the facts that lie in the foregoing financial and mileage statistics it would be a strong one; but in addition the companies have had to reckon with economic changes involving advances in the costs of labor and materials that have added seriously to the expense of operation. The extent of the increase in the cost of materials used in large quantities by electric railways is shown by a statement compiled in February, 1908, when advances in fares were under serious consideration by many lines in Massachusetts. Some declines in prices have taken place since these figures were prepared, but quotations are again firmer and there is no sound reason to doubt that the tendency of the times is toward a still higher level. Figures showing the approximate increases in costs of materials during the seven years ended in February last, as compiled by one company, follow:

Rails—girder.....	\$27.90 to \$40
“ —tee.....	\$22.10 to \$32.25
Rail joints, in same ratio.	
“ bolts, per keg.....	\$3 and \$3.50 to \$4 and \$4.50
“ spikes, per keg.....	\$2 and \$2.35 to \$3 and \$3.75
“ bonds, increase 50 to 75 per cent.	
Ties.....	.35 and 40 cents to 50 and 60 cents
Paving blocks.....	\$45 per 1000 to \$55 per 1000
Trolley wire.....	12 and 14 cents to 20 and 25 cents
Iron wires, increase 20 to 30 per cent.	
Copper wire, increase 50 to 90 per cent.	
All other line material, 20 to 40 per cent.	
Electrical equipment of cars and power stations, increase 20 to 50 per cent.	
Gears.....	\$11.25 to \$13.25
Pinions.....	\$1.85 to \$2.50
Armature coils.....	\$15 to \$21.75
Babbitt.....	.26 cents per lb. to 39 cents per lb.
Iron and steel, increase \$1 to \$2.25 per ton.	
Car wheels, pair.....	\$30 to \$38
Poles, increase 20 to 30 per cent.	
Car bodies, changed from single to double truck, representing an increase of 30 to 40 per cent in first cost.	
Double trucks in place of single, at approximately double the cost.	

The necessity of operating such cars in winter with four instead of two motors, representing an extra first cost of approximately \$1,000 per car and added maintenance charges, on account of extra wear and tear.

Increased output of power stations required to operate such cars.

THE TRANSFER SYSTEM

It will be clear to readers who have studied fare and transfer systems, but desirable to repeat, that the same considerations that apply to existing fare systems are applicable with equal force wherever, on street railways, transfers are given. Urban transportation had its beginning in coach lines that were operated for short distances. Horse railways were operated originally for short distances. With eventual consolidations the lengthened ride and the transfer system came into existence; and they have in-

creased, both by legitimate and illegitimate use, until they now imperil the safe financial operation of the properties of the country. The gross revenue of a street railway is generally assumed by the public to be the result obtained by multiplication of the total number of passengers carried by the unit of fare received. The dilution of the fare by gradual extension of the transfer system has been forgotten. This has been due in part to the desire of some companies to secure increases in gross revenue without proper reflection upon the burdens they were assuming by indefinite extension of the transfer system and in part to a failure to appreciate how grossly the transfer privilege would be abused.

REGARD FOR PROPERTY RIGHTS

To comprehend why it has been found desirable for various electric railways, with the approval of the Board of Railroad Commissioners, to maintain increased fares, it is necessary to understand the customs of the people of Massachusetts and their general regard for property rights. In few other sections of the country, if any, is there to be found the same respect for the rights of property that exists in Massachusetts. The attitude which this fact denotes has been building through a period of many years. Where there are people of moderate means, which have been accumulated perhaps through several generations, a sentiment of insistence upon property rights will be strong. If the number of people in whom this sentiment exists is sufficiently large it will constitute the controlling opinion of the community. Such is the condition in Massachusetts; but unfortunately this condition does not exist in newer communities in the Central West or even in some old-established communities in certain eastern States where the same necessity for increased fares prevails that was existent in some of the Massachusetts properties.

Since, in the main, the laws of Massachusetts reflect the sentiment of residents who endeavor to preserve an even balance between the rights of property and those of the people served by public utility corporations, it may be stated that the principal end effected by the statutes of the State is the issue of capital obligations under supervision of the Railroad Commission, which has the power to ascertain that the proceeds of securities are devoted to the uses for which they were authorized. From the public point of view this statement presents one important fact bearing on the situation.

DIRECTORS ESTABLISH FARES

From the company point of view the most important fact is that the board of directors has the right to determine the rate of fare. The directors are the duly elected representatives of the stockholders. The law of Massachusetts states that “every street railway company * * * may establish the rates of fare for all passengers and property conveyed or transported in its cars, subject, however, to the limitations named in its charter or hereinafter set forth.” These limitations, so far as they are named in the charter, are, of course, a matter of contract with the State and must be observed. The clause “hereinafter set forth” just quoted, refers to limitations relating to special fares for certain classes of traffic, as provided in the laws of the State.

When the law stipulating that the company may establish the rates of fare, subject to the foregoing limitations, is under consideration, a distinction should be drawn between a State charter and a franchise from a local board of selectmen or other authorities of similar rank. The position of the Massachusetts courts has been that no matter

what agreements respecting rates have been made by directors of street railway corporations with local boards, such conditions are not binding provisions of a franchise. The Supreme Court of Massachusetts has upheld the contention that the statutes provide explicitly that the fares on street railways should be established by the directors. A decision was rendered by this court in 1904 in the case of *Albert Keefe vs. the Lexington & Boston Street Railway*, in which the contention of counsel for the railway on this point was upheld. The plaintiff had refused to pay a fare to the company, but finally did pay it under protest that the collection of such fare was a violation of the provisions of the franchises of the company. He appeared before the Railroad Commission, which declined to consider a complaint, holding that the company was acting within the law in following the course it had taken.

FARES CONSTITUTE THE TARIFF

Prior to the time when the decision in the Keefe case was rendered the attorneys for the defendant company filed a brief in which the following statement was made:

The situation of electric railroads is becoming more and more like steam railroads. The routes are becoming longer, the railroads are not, as formerly in the case of horse railways, confined to the limits of one town, but have become interurban, extending sometimes through many towns, and the confusion that must result from making this matter of fares a matter within the control of local boards is certainly something which should not be construed into the law unless it is absolutely necessary that the law receive that interpretation. The only practical way of establishing fares would seem to be by the board of directors. This is the method expressly provided by law and there would seem to be no excuse or reason for attempting to put upon the law any other construction inconsistent with this express, absolute and clear provision. * * *

These provisions in regard to fares in the absence of evidence to the contrary simply constitute the company's tariff schedule.

It therefore follows that in construing the interpretations of the provisions in regard to fares exactly the same rules of construction should govern as govern the interpretation of the tariff published by steam railroads. Being no part of the charter, franchise or law under which the corporation is operated, there is no occasion for construing the provision in regard to fares most strongly against the corporation.

The matter of the use and the misuse of transfers has been greatly increasing on street railways as the lines have become consolidated and as new lines have been built. Provisions in regard to fares and especially in regard to transfers, which were established in good faith and which were originally used in good faith in the properties for which they were intended, sometimes become capable of misconstruction with the changed conditions and a disposition is sometimes found, not often on the part of public authorities, but frequently on the part of individuals, to misconstrue and twist provisions in regard to fares and transfers into meanings never intended, and to tack together local arrangements for the purpose of arriving at a result never intended, with very little, if any, gain to the traveling public, but to the great detriment, possibly, of the street railway company.

DECISION OF SUPREME COURT

The decision of the Supreme Court upholding the position of the company stated:

Under the statute, 1898, section 13, the Board of Aldermen of a city or the selectmen of a town, in granting a location to a street railway company, may prescribe the manner in which the "tracks shall be laid and the kind of rails, poles, wires and other appliances which shall be used, and they may also impose such other terms, conditions and obligations in addition to those applying to all street railways under the general provisions of law, as the public interest may in their judgment require." The question is whether a condition may be imposed regulating and re-

stricting the fares to be charged. The statute contains other provisions in regard to fares. By the public statute, chapter 113, section 43, which was in force when the defendant corporation was organized (R. L., chapter 112, section 69), the directors of a street railway company "may establish the rates of fare for all passengers and property conveyed or transported in its cars, subject, however, to the limitations named in its charter or hereinafter set forth."

Section 44 provided for revision and regulation of the fares by the Railroad Commissioners; section 45 provided that nothing contained in the two preceding sections should authorize the company or the board to raise the rate of fare above the rate established by agreement, made as a condition of location or otherwise, between the company or its directors and the mayor and aldermen of a city or the selectmen of a town, except by mutual arrangement with the parties. This section recognizes the validity of such agreements under the former statute. But this and the next preceding section were repealed by the statute of 1898, chapter 578, section 26, leaving the section as to the authority of the directors to stand without any limitations upon their right.

A new section in regard to the revision of fares by the Railroad Commissioners was enacted, which is statute 1898, chapter 578, section 23. Under this last section "the fares shall not, without the consent of the company, be reduced below the average rate of fare charged for similar service by other street railway companies, which, in the judgment of the Board of Railroad Commissioners, are operated under substantially similar conditions." This statute gives to the directors primarily the right to fix and regulate fares, which then makes their action subject to revision by the Railroad Commissioners who are to act, according to the terms of the section, upon broad considerations of public policy. "The conditions which may be imposed in granting a location are of a different character and do not include those for which special provision is made in other parts of the statute. (See *Newcomb v. Norfolk & Western Ry. Co.*, 179 Mass., 499.) With street railways extending long distances and passing through numerous cities and towns it would be unwise and inexpedient to permit each town to fix the fares within its boundaries as a condition of granting a location. The purpose of the Legislature to prescribe broad and general provisions for the regulation of fares is further emphasized by statutes of 1901, chapter 180 (R. L., chapter 112, section 73), which puts street railways upon precisely the same grounds as railroads, as to provisions relative to changes and regulations of their fares.

The acceptance by the defendant of the locations granted by these towns did not make valid those conditions as to fares which the towns could not legally impose, nor did it make a contract as to fares between the corporation and the selectmen or the town. The defendant might, therefore, at least prescribe for its passengers the payment of any fare which is reasonable."

The importance of the decision of the court in this case is indicated by the fact that since it was rendered the Railroad Commission has declined to approve certificates of location granted by local boards if they contained regulations as to fares.

The Railroad Commission of Massachusetts takes no cognizance regarding changes of fares made street railway companies unless formal complaint by citizens follows. In some recent instances the necessity for increases in fares has been recognized so clearly by the residents of the communities served that no petition for a hearing before the Railroad Commission has been presented.

MAKING CHANGES IN FARES

Changes of fares have been placed in effect by various Massachusetts railways either through readjustment of zones or by increases of the unit of fare, as from 5 cents to 6 cents. The establishment of a charge for transfers has increased the revenues. An increase in the number of zones on interurban lines, such as has been made by some of the companies, produces enhancement of the gross revenues at

the expense of two classes: (1) through passengers from one terminal to another; (2) short-distance riders who happen to be so located that a change in the zone affects them seriously. An increase of the unit of fare distributes, of course, the additional charge upon all the patrons of the system affected.

Changes in fares in Massachusetts are not wholly a matter of recent development. Such changes have been made by various companies within a few years, but it is only within recent months that some advances have been urged and made in certain cases with the result that the existence of two conditions has been brought emphatically before electric railway companies in the country: (1) appreciation of the fact that fares of 5 cents were in some instances wholly inadequate; (2) realization of the fact that the Railroad Commission, the duly constituted public authority with jurisdiction over electric railway properties, recognized the need of certain lines for more gross and net revenues.

In view of this situation it is desirable to inquire whether the conditions which justify increases in fares have been developed recently or whether they have existed for years but have been appreciated at their true importance only within the last few months. It will be clear that, in numerous States, even in the old Commonwealth of Massachusetts, pioneers in the construction of electric railways took some chances. Some roads have been built and abandoned. Other lines would be abandoned if it were not considered desirable to hold them for strategic reasons. Of the properties that are not now yielding satisfactory returns some will be profitable in time, but they must struggle, even with higher fares, until the density of traffic increases materially. Some properties pay dividends that would never have been shown as earnings if a method had been provided for creating reserves for maintenance and expenditures that were not necessary during the early years, but were essential to successful continued operation later.

WHERE A PUBLIC UTILITY IS NOT PROFITABLE

It is, of course, always a question to what extent the public should be forced to support a public utility that was built without sound justification for its existence. It will be plain that some roads never would have been constructed if the misfortunes of their careers could have been forecast. When a railway is built the assumption is, usually with complete justification, that development and permanent settlement of the territory will follow. When a railway is completed in an unremunerative locality and fails to become profitable after a lapse of a reasonable number of years, loss or change in fares must result. During a period of that character the securities of the company will have passed from the hands of the promoters and bankers to the individuals who buy for permanent investment. When it becomes evident that a line, although honestly capitalized, will never be profitable on a 5-cent fare basis, the capital must be scaled to a point that represents less than the actual investment in the property or the fare must be increased. It is unquestionably desirable in many small communities that railways be operated for the convenience of the public even if a higher rate of fare is necessary than would be paid in communities where there was greater density of population. After a property of this kind has existed a number of years it becomes a vital part of the community. Residential and business sections develop in such a way that they are dependent on the operation of the railway. Where such is the case it is for the interest of the community that the continued operation of the line be assured and this can be done only on a profitable basis. Otherwise

the only course open to the company is abandonment of the line, which would be attended with serious public inconvenience. If a situation develops that threatens the solvency of a property which is administered honestly concessions should be granted by the public that will permit the company to conduct its affairs so as to assure a reasonable return on the investment. Whether these concessions take the form of increased fares, decreased service or the introduction of special facilities, such as the development of freight business, it is clear that they are in the interest of the convenience of the public. All who live on lines of railways that are clearly unprofitable will understand that if the service should be discontinued there would be open but two ways of travel—walking, or riding in a carriage. When the alternatives are presented it is not open to debate that the facilities of the street railway are preferable to no rapid transit facilities at all, whether the fare charged is 5 cents or even 10 cents.

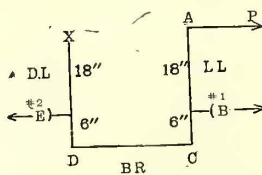
The situation in Massachusetts has been treated as a whole in this article showing the main causes of the movement for increased fares because of the belief stated that the changes are destined to be widespread. In ensuing articles the changes made by various companies will be taken up in detail.

(To be continued)

THE DEAD-LEVER

Many men otherwise well qualified in the maintenance and adjustment of existing brakes, fail to grasp the function of the dead-lever—a name probably responsible for the indifference with which its welfare is regarded. As a rule shopmen think no more of lengthening or shortening this lever than they would of changing a brake rod. Nevertheless, changing a dead-lever changes the shoe pressure. In the accompanying sketch illustrating one-half of an inside-hung brake rigging, the arrow heads show the directions in which a pull on rod AP will move the other lettered parts of the rigging. Assuming a pull of 1250 lb. on AP, shoe No. 1 will apply with a force of $(1250 \times 24/6)$ or 5000 lb. The bottom rod CD will be subjected to a thrust of $(18 \times 1250/6)$ or 3750 lb., which is the force applied to the lower end of the dead-lever DX.

Neglecting friction, the force with which shoe No. 2 will be applied is then $(3750 \times 24/18)$, or 5000 lb. Here the levers are proportioned alike and the shoes are subjected to equal pressures. Now suppose 6 in. to be cut from the top of the dead-lever, all other dimensions remaining the same. In this case the 3750-lb. force applied to its lower end produces on No. 2 shoe a pressure of $(3750 \times 24/14)$, or 6428 lb., which is 28.5 per cent more than the pressure on No. 1 shoe; this is an excessive allowance for even excessive friction. Were the dead-lever lengthened instead of shortened, a difference in the opposite direction would be secured. Tampering with the length of the dead-lever is generally done either as a matter of convenience in anchoring its upper end or because the upper end interferes with something else on the equipment. An ill-judged change may result in skidding the wheels on that end, in useless wear of shoes, or in decrease of total braking power. In any case such a change should be accompanied by a corresponding change in the short end of the lever, so that the shoe pressure will remain the same.



POSITION OF STATE COMMISSIONS REGARDING INTER-STATE ACCOUNTING SYSTEM

Letters to the *ELECTRIC RAILWAY JOURNAL* from State Railroad Commissions show that a number of these supervising bodies have taken no action regarding the uniform system of accounts for electric railways recommended by the Interstate Commerce Commission. Some commissions have adopted the Interstate classification, and others indicate that they will do so. The letters follow:

T. R. Maxwell, secretary, Mississippi Railroad Commission.—Our commission has taken no action with respect to the classification of electric railways. We have only one such railway in our State.

H. D. Manington, secretary, Railroad Commission of Ohio.—This commission has concluded to adopt the accounting system for electric railways as prescribed by the Interstate Commerce Commission, but no formal order as yet has been made putting the same into effect. A meeting has been called of the auditors and other accounting officers of electric lines for Dec. 1, at which this classification will be discussed and explained. The letter calling this meeting, signed by Mr. Manington, states: "This commission will put into effect its order approving the classification of operating expenses, operating revenues and expenditures for road and equipment of electric railways for the State of Ohio prescribed by the Interstate Commerce Commission, to take effect on Jan. 1, 1909, the same date as this classification takes effect for interstate reports. That there may be an understanding about the keeping of these accounts and the rendering of reports thereunder, it has been deemed advisable by the commission to have a meeting of the auditors, or other accounting officers, of electric lines subject to its jurisdiction. It is believed that such a meeting will be productive of mutual understanding which will be helpful to all concerned. The commission has fixed upon Tuesday, Dec. 1, 1908, at its hearing room in the State Capitol, at 1:30 o'clock p.m., for such meeting, and directs me to invite and urge you to be present on that occasion. There will be sent you copies of this classification that you may familiarize yourself with it before the meeting. Will you be good enough to acknowledge receipt of this letter and advise definitely if you will attend."

Richard T. Wilson, clerk, Virginia State Corporation Commission.—The situation in Virginia is about the same at this time as it was when I wrote you on June 5. [See *ELECTRIC RAILWAY JOURNAL* of June 13, 1908, page 86.—Eds.] The commission desires to follow, and wherever possible will follow, the system of accounting adopted by the Interstate Commerce Commission for all public-service corporations, but our statutes require that each steam and electric railway shall report to the commission annually, as of June 30 each year, covering the 12 months preceding. Had the Interstate Commerce Commission put its new system of accounting for electric railways into effect July 1, 1908, it is more than probable the commission would have adopted the system. As the matter now stands it will be impossible for any action to be taken prior to July 1, 1909, but no definite stand has yet been taken by the commission relative to adopting the new system as of that date.

D. B. Carnett, secretary, Kentucky Railroad Commission.—This commission has not yet taken any definite steps regarding the classification of accounts for electric railways promulgated by the Interstate Commerce Commission, and it is not likely it will do so this year. No formal announcement has yet been made by this commission to electric railways within the State.

E. C. Farrington, clerk, Railroad Commissioners of Maine.—The commissioners of this State have not taken any action regarding the adoption of the classification of electric railways promulgated by the Interstate Commerce Commission. It is uncertain what action they may take in the future.

Clark Perkins, secretary, Nebraska State Railway Commission.—It has been our purpose to conform as closely as possible to the requirements of the Interstate Commerce Commission in the classification of accounts for electric railways and to that end we made use of the tentative classification provided by Interstate Commerce Commission Accounting Series Circular No. 20, issued on Jan. 10, 1908. After our blank forms had been prepared we learned that the Interstate Commerce Commission had decided to change this classification materially. We used these forms this year, however, asking the various electric railways operating in Nebraska to fill them out as completely as possible under existing methods of bookkeeping, with the understanding that next year's form would be changed to conform as closely as possible to that of the Interstate Commerce Commission.

William Kilpatrick, secretary, Railroad & Warehouse Commission of Illinois.—This commission has not yet taken action regarding the classification of accounts for electric railways, as promulgated by the Interstate Commerce Commission. Our commission adopted a form of report modeled very largely on the line of the reports required from steam railroads in our State. It has been the policy of this commission to adopt as nearly as possible the form of reports required by the Interstate Commerce Commission, but the commission has not yet taken up the matter of the adoption of the form recently promulgated as to either steam or electric lines by the Interstate Commerce Commission.

T. M. Bradbury, secretary, Missouri Railroad & Warehouse Commission.—This department has taken no action toward classifying accounts or other information relative to electric roads. I presume some action will be taken shortly, at least after the board is reorganized in January next, if not before. The matter has been under consideration for some time, but no definite plans have as yet been agreed upon.

Chas. B. Riley, secretary, Indiana Railroad Commissioners.—This commission has not yet taken action. Owing to the delay by the Interstate Commerce Commission in the preparation of annual report blanks for electric roads, we found it necessary to promulgate a form of our own, which we are now using. We secured a supply for two years which covers the years up to and including June 30, 1909. It will ultimately be the purpose of this commission, I have no doubt, to get in perfect harmony with the Interstate Commerce Commission and the other commissions on the matter of accounts and reports by electric railways.

J. P. Burlingame, commissioner, Rhode Island.—The railroad commissioner has not taken any action regarding the classification of accounts for electric railways promulgated by the Interstate Commerce Commission and does not intend to take any action at the present time.

Harry S. Calvert, secretary, Pennsylvania State Railroad Commission.—The commission has not taken any action on this matter for the following reason: The act creating this commission provides in Section 12 that all common carriers subject to the jurisdiction of the commission may be required to file copies of annual reports and that where such carriers are under the jurisdiction of the Interstate Commerce Commission the reports filed with this commission shall be identical with those filed with the Interstate Com-

merce Commission: "And as to all common carriers subject to this act, and not subject to the Interstate Commerce Commission, may require that such common carriers file annual reports in the form prescribed by the commission." You can readily see from this language that the Legislature has limited the power of the commission as to the form and classification of accounts, at least insofar as street railways doing an interstate business are concerned. It so happens, however, that in passing the act the Legislature did not change previous legislation providing for the collection of annual reports of railroads and street railways by the Bureau of Railways in the Department of Internal Affairs. By reason of this situation the commission has decided not to require any annual reports from railroads and street railways, at least until such time as the Legislature can again go over the subject. The next meeting of the General Assembly begins in January, 1909. In the meantime, however, the commission has employed an expert accountant to devise for it a form of annual report; this work is not complete.

Dwight N. Lewis, secretary, Board of Railroad Commissioners of Iowa.—This board will adopt the classification of accounts for electric railways promulgated by the Interstate Commerce Commission. This year we will use for reports of electric railways to this board form "G" issued by the Interstate Commerce Commission. This board desires to co-operate in every way that it may to bring about uniformity in the requirements of State and national commissions.

Thomas Yapp, assistant secretary, Railroad & Warehouse Commission of Minnesota.—The only electric lines under the jurisdiction of this commission are the suburban lines. We have, however, joined with other State commissions in taking definite action regarding the classification of accounts and expect to receive from the Interstate Commerce Commission a supply of the blanks in the near future.

Chas. H. Love, secretary, Tennessee Railroad Commission.—This commission has taken no action regarding the classification of accounts for electric railways and there is no probability that it will take such action in the near future.

Louis C. Cramton, secretary, Michigan Railroad Commission.—The uniform classification of accounts for electric railways promulgated by the Interstate Commerce Commission was considered in June at a conference between this commission and the electric companies of the State, at which representatives of all of the companies expressed themselves as satisfied that the classification was the best that could be procured at this time. Owing to the delay in securing complete copies of the classification an order of the commission finally disposing of the matter has not yet been made. We are now consulting with the roads of the State as to the date when the classification should be made effective.

Henry M. Putney, chairman, New Hampshire Railroad Commission.—This commission has taken no action regarding the classification of accounts for electric railways promulgated by the Interstate Commerce Commission.

H. K. Howry, secretary, Montana Railroad Commission.—This department has taken no action with regard to the classification of accounts for electric railways, as we have not required annual reports from such corporations. At this time we are unable to advise you as to what course we will pursue in this connection in the future.

Geo. F. Montgomery, secretary, Georgia Railroad Commission.—This commission has not taken any action relative to the classification of accounts for electric railways

promulgated by the Interstate Commerce Commission. We have adopted the forms prescribed by the Interstate Commerce Commission relative to steam lines and I take it that when reports of electric railways are required by this commission the same form used by the Interstate Commerce Commission will be adopted.

James W. Foley, secretary, Commission of Railroads, North Dakota.—The commission of this State has taken no action with reference to the classification of accounts for electric railways proposed by the Interstate Commerce Commission. There is only one small urban system of electric railway in this State.

J. M. Winterbotham, secretary, Wisconsin Railroad Commission.—This commission has taken no action regarding the forms promulgated by the Interstate Commerce Commission, but the question will be taken up within the course of a few months.

Walter D. Wagner, secretary, California Railroad Commission.—This commission has taken no definite action regarding the classification of accounts for electric railways as promulgated by the Interstate Commerce Commission for the reason that it has not yet been definitely determined if the electric railways come within the jurisdiction of this commission. We hope that a determination of this matter will soon be had, when the commission will be prepared to take definite action.

E. C. Shiner, secretary, Kansas Board of Railroad Commissioners.—The Board of Railroad Commissioners has taken no formal action in regard to the classification of accounts for electric railways promulgated by the Interstate Commerce Commission; it is quite likely, however, that upon the promulgation of the classification of accounts by the commission the Kansas commission will require the use thereof by electric lines operating in this State.

SUGGESTIONS TO PASSENGERS IN MINNEAPOLIS

The most conspicuous place for signs in a double-ended car is over the doors. In a single-ended car the space over the front door, when it is not occupied by a register, or that on the door itself, is one which cannot fail to be seen by all passengers. In Minneapolis, where single-ended cars are used exclusively, the company has reserved the space on the inside of the front door for special notices and has carried there for a long time a card giving instructions as to the proper method of boarding and leaving cars. Recently, however, A. W. Warnock, general passenger agent of the company, decided that this door space afforded a good opportunity to impress special injunctions on the traveling public. Since that time three signs have been posted there, each occupying the space for about a month. Mr. Warnock has other suggestions to offer in the future. Those which have already appeared are the following:

Politeness and patience to passengers are required by the company of all trainmen.

It is suggested that passengers also exercise politeness and patience to trainmen.

No large packages, lumber, picture frames or bulky merchandise that cannot be carried on lap or under seat will be allowed on this car. Musical instruments and folding baby-carts will be carried when there is room. No dogs carried without special written permit.

The company desires to keep its cars clean and sanitary. This is impossible without co-operation of passengers, which is requested and will be appreciated. Please do not deposit nutshells, fruit skins, papers or other litter in any part of car

COMMUNICATIONS

COST OF BRAKE SHOE MAINTENANCE IN BROOKLYN

BUFFALO, LOCKPORT & ROCHESTER RAILWAY COMPANY,
ROCHESTER, N. Y., Nov. 6, 1908.

To the Editors:

The Oct. 24 issue of the *ELECTRIC RAILWAY JOURNAL* contained an article on brake shoe standardization and maintenance costs of the Brooklyn Rapid Transit Company. Do the costs as stated include credits for scrap in worn out shoes?

CLARK PRATHER,
Master Mechanic.

[The costs given do not include credits for scrap. The value of the scrap varies considerably, but at the present time is about \$9 per long ton.—Eds.]

THREE-PHASE OR SINGLE-PHASE FOR HEAVY ELECTRIC TRACTION

NEW YORK, Nov. 13, 1908.

To the Editors:

In the *ELECTRIC RAILWAY JOURNAL* of Oct. 10 mention was made of the first anniversary of the little magazine *Electric Trunk Line Age*. I fear, however, that you misinterpret the purpose of the magazine when you say that it advocates the three-phase system of electric traction, as this is not the case. We have well-defined ideas concerning the advantages and disadvantages of all the different electric railway systems. But we have always maintained that none of them is universally applicable and that it is necessary to study every railway proposition on its own merits and in great detail before it is possible to decide which system should be used.

Roughly speaking, I believe the continuous current system to be most suitable for comparatively short distances and heavy traffic, the single-phase alternating-current system for long distances, but for light traffic only, and the three-phase alternating-current system for long distances and heavy traffic.

Electric Trunk Line Age has aimed from its beginning to discuss results and possibilities of electric trunk-line operation without any bias whatsoever. If we have seen fit to condemn certain installations and to point out the merits of others, every case was judged individually, and we have freely cited actual operating data and quoted eminent authorities in support of our opinion.

By referring to the past 13 numbers of this publication you will notice that our columns are fairly evenly devoted to the consideration of the continuous-current, the single-phase and the three-phase systems and that each has been treated without prejudice or partiality.

To thoroughly clarify my position I might add that, while I have read two papers before the American Institute of Electrical Engineers on three-phase traction, neither Muralt & Co. nor myself individually have any connection, corporate or professional, with the interests identified with the three-phase system. If I have recommended the use of this system from time to time under certain special conditions it was simply because from my personal experience with three-phase equipment in Europe I knew that it was particularly well adapted for those cases. I have just as freely recommended the continuous-current system wherever it was particularly advantageous, and I have never hesitated to say that, in the present state of the art, the

single-phase system does not yet seem to be suitable for very heavy railway work and I cannot see any advantage in using it where it is apt to fail and thus provoke adverse criticism of electrification matters in general.

C. L. DE MURALT.

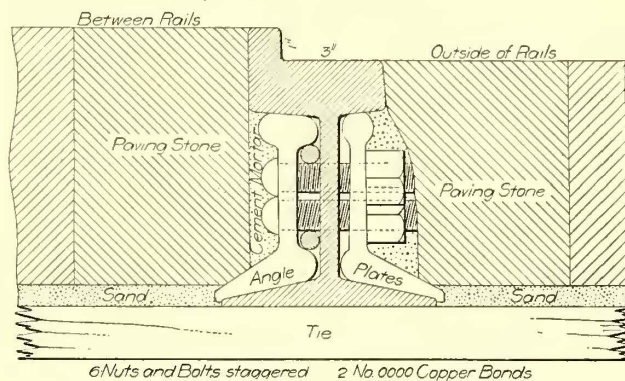
MR. VOYNOW'S PAPER

NEW YORK, Oct. 28, 1908.

To the Editors:

I was very much interested in the paper of C. B. Voynow, assistant engineer, Philadelphia Rapid Transit Company, published in your issue of Oct. 17, 1908. I believe such a construction would be much more popular than the present practice, because—

- (1) It would not present so great an obstruction to traffic.
- (2) It would admit of the use by the public and the operating company of gasoline automobiles with rubber tires.
- (3) There would be little noise with electric cars, and absolutely none with rubber-tired vehicles.
- (4) The chance of derailment would be less, and the car could be more easily replaced on the track.



6 Nuts and Bolts staggered 2 No. 0000 Copper Bands
Proposed Flanged Track Construction

(5) Brake shoes and brakes could be more satisfactorily arranged and would be much more efficient on account of the wider tread.

(6) Any suitable tread of wheel could be used, provided the inside gage was maintained.

To my mind a serious difficulty that would have to be overcome, particularly for moderate or high speeds, is that the wheels would have to be keyed to the axle in such a way as to prevent the possibility of their slipping off or being forced out of place by their constant hammering against the rail flange. With the present type of flanged wheel the side blows on the wheel flange tend to drive the wheel more firmly on the tapered wheel seat of the axle. I should be glad to know Mr. Voynow's ideas in this regard, and what he would suggest to remedy this possible objection.

The accompanying sketch shows my idea of track construction, suggested at first sight of the paper in question.

T. J. NICHOLL.

COMPOSITION OF TROLLEY EARS

Trolley ears are a class of material which the average electric road purchases with little regard to composition. The first cost is small and therefore most roads buy with no specifications other than dimensions. The cost of frequently replacing, or the delay to traffic and possible danger to life from a dangling wire, is, however, a serious item, and one which can be materially reduced by using a metal of suitable composition. A city system, handling a heavy

traffic where delays cost money, recently had considerable trouble by the frequent breaking of ears, which they were purchasing of a reputable manufacturer. Two of the ears were sent to the Arthur D. Little Laboratory in Boston for analysis. The report from the laboratory showed the following compositions:

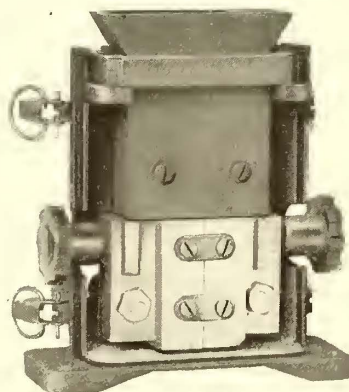
	1	2
Copper	60.5	78.3
Zinc	38.5	16.5
Lead	0.4	4.4
Iron	0.1	0.2
Tin .....	..	0.5

The analyses showed plainly the cause of the trouble: No. 1 is made of the ordinary 60-40 brass and is not strong enough for such work; No. 2 is evidently made from scrap composition and also fails to have the required strength. This company is now buying under a strict specification. A sample from every shipment is analyzed and the number of failures of trolley ears on this road has been materially reduced.

MAGNETIC FUSE BOX FOR RAILWAY SERVICE

When circuit breakers were first installed on street cars they were looked on with favor as they materially reduced the expense for fuses. The motormen, however, found that it was so easy to throw in the handle of the circuit breaker that it has become a frequent occurrence to overload the motor and trip the breaker. This is unnecessary and is frequently a cause of fright to the passengers and the excessive flow of current when the circuit is broken suddenly causes heavy strains on the motor windings. With the existing apparatus it is too easy for the motorman to reset the protective device on his car. For this reason a number of large railway companies are equipping their cars with a simple type of fuse

recently developed and placed on the market by the Westinghouse Electric & Manufacturing Company in addition to the standard circuit breaker. This new device is a magnetic blow-out form of fuse which overcomes the objections to the use of the old fuse box. In general design it is similar to that of a street-car circuit breaker in that it has an all-metal case with the live parts entirely enclosed. It is intended to be placed under the car. The main current is carried by a short copper strip extending down from the terminals in the form of a loop. This loop passes through an arc chute, which is supported inside of laminated punchings, thus providing an efficient magnetic blowout. The blowout is produced by the ribbon itself without any exterior coils whatever, as a single turn of the ribbon through the iron circuit provides ample magnetism to blow out the arc formed when the ribbon melts. As shown in the illustration the fuse box is very compact. It will carry 400 amp continuously without overheating, while the fuses are rated at from 250 amp to 600 amp and are so constructed that they will blow in 30 seconds on 100 per cent overload of this rating. New fuses may be readily inserted by turning the insulating handles on each side of the box without opening the case or using any tools whatever. For the purpose of repairs the sheet-iron front of

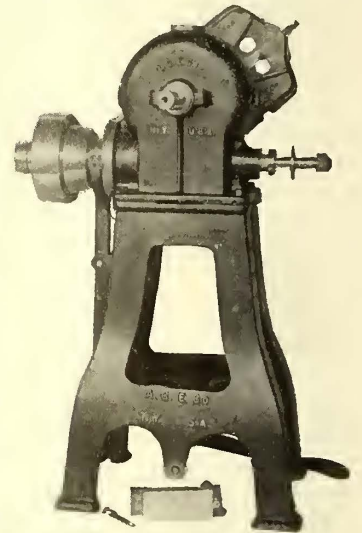


Magnetic Fuse Box

the box may be readily removed. The arc chute is a single piece and may be readily and cheaply replaced. This fuse box, while intended primarily for street cars, is not confined to them exclusively, but may be used on industrial motors wherever enclosed fuses would be unsuitable for any reason.

AN IMPROVED COIL WINDING MACHINE

The American General Engineering Company, New York, has been making a number of changes and improvements in the various types of electric railway shop machinery of which it makes a specialty. One of the new and improved machines is shown in the accompanying illustration. This is an armature and field coil winding machine, which contains a number of new features. The frame has been redesigned, and as now made is rigid and strong, and also prevents accumulation of any dirt under the machine. The winding arbor or spindle has been extended so that a winding frame can be attached to either side of the machine and coils wound in both directions. The main shaft has also been extended in front, to form a direct-driven spindle, on which small coils, such as are used in air compressor motors, can be rapidly wound. The friction driving clutch has been changed so as to strengthen the pulley and lessen the wear on the bearing surfaces, which are of ample area and properly machined. The main shaft carries a thrust collar made of tobin bronze to take up the horizontal thrust of the worm drive. With the worm drive used on this machine, the spindle ceases to revolve the moment the pressure is released from the clutch treadle, thus insuring the positive stop essential in coil winding, and, it is claimed, absolutely eliminating any back lash. A revolution counter can be supplied with the machine to relieve the operator of the work of counting the number of turns on a coil. The machine is also fitted with a semi-removable gear case cover, which fits tightly around the main shaft and completely encloses the worm and wheel, preventing dust and dirt from entering and cutting the threads, and which can be quickly taken off by simply removing two screws, exposing the entire mechanism and permitting ready inspection or oiling. The screw cap on the upper half of the gear case permits the insertion of lubricating grease to the worm wheel without the removal of the upper half of the gear case. The machine is very compact, occupying a floor space only 24 in. x 28 in., and weighs approximately 300 lb. It is an extremely useful and powerful machine in any shop where field or armature coils are made or repaired, and will stand the strain of the heaviest wire, flat or round. The illustration also shows one of this company's new field coil winding frames mounted on the rear end of the main spindle. This winding frame, as well as the winding machine itself, is fully covered by United States and foreign patents.



Improved Coil Winding Machine

News of Electric Railways

Traction Affairs in Cleveland

Some confusion followed the spectacular announcement of Mayor Tom L. Johnson of Cleveland, that his personal fortune had been dissipated while he had given his time and attention to municipal and railway affairs and the settlement of the estate of his brother, Albert L. Johnson, who was interested in the Lehigh Valley Transit Company and the New Jersey & Pennsylvania Traction Company. Mr. Johnson's announcement had evidently been prepared carefully.

The impression in Cleveland has always been that Mr. Johnson possessed a fortune of several million dollars amassed from his steel and street railway operations, and that it was invested in securities or in some other way that yielded a good return. However, of the investments of Mayor Johnson during the last two or three years, only the money put into stock of the Depositors' Savings & Trust Company, recently acquired by two other banks, and what may have been used in the affairs of the new railway companies, has come to the notice of the public. Nothing else is generally known to have been invested in Cleveland, with the exception of the Euclid Avenue residence and a few other pieces of real estate which are in the name of Mrs. Johnson.

There is no disposition among the fair-minded business men of Cleveland to take an uncharitable view of the condition said to exist in the private affairs of the Mayor, but at the same time they will probably make sure that the public and widespread announcement of misfortune at this time is not turned into capital for political purposes. The statement made by Mr. Johnson, in his first announcement, that he will be a candidate for Mayor again is looked upon as the opening of his campaign.

The most important enterprise in which Mr. Johnson is known generally to be interested at this time is the Sheffield Land Company of Lorain. Mr. Johnson's holdings in the company are large. They were secured through the Johnson Company, which sold its interest in the steel plant at Lorain and the street and interurban railways several years ago.

Up to the end of last week no move had been made, so far as known, to bring Mr. Johnson's affairs into the courts. He states that he will institute no bankruptcy proceedings himself, but hints that his "enemies" are likely to push him. To whom he refers in this statement is not known. In reality, he appears to be the only person who has much knowledge of his personal business affairs.

During the last week Receiver Warren Bicknell, of the Municipal Traction Company, has given the greater part of his time to the consideration of schedules and improvement of the service in general. It is the intention to arrange schedules so as to give the best possible service with the facilities at hand. The G. C. Kuhlman Car Company has been instructed to complete the work of changing the 23 cars in the shops at the time the receivership was granted to the pay-enter type and deliver them as soon as possible. This was done in order that the company might have the use of them on the various lines needing additional service. Just what will be done regarding the equipment of the entire system with this type of cars has not been decided. Conductors on cars of this type were instructed on Nov. 19 to collect fares at the door when passengers enter and the receivers will experiment with them in this way as far as possible. The cars on which fare boxes have been installed are being operated in the usual way.

Early in the week F. C. Howe, assistant treasurer of the Municipal Traction Company, handed in his resignation and it was accepted. Thomas P. Schmidt, who has been in charge of the free stock exchange, has also resigned. The employees of that office and several clerks in the auditing department have also given up service under the receivers.

The receivers announced in Cleveland on Nov. 18 that in putting on new platform men the old employees of the Cleveland Electric Railway would be given the preference, because of their experience, if they desire to take up the work again. Otherwise, experienced men will be secured wherever they may be found. Conductors and motormen will be given time at the barns to wash.

On the evening of Nov. 21, at a meeting of trainmen, the strike was declared off officially, and it was decided that the men are free to apply for the places they gave up. They will be given vacancies in accordance with their service and experience and no attempt will be made to start them

as new men. Dr. Elroy M. Avery attended the meeting and urged the men to co-operate with the receivers in every possible way, and do their best toward making the operation of the system a success.

The employees at the repair shops have been busy since the receivers took up the business, and so far as possible all equipment will be put into such shape that the best service may be secured from it.

To make clear what properties passed into the hands of the receivers, it may be stated that the court gave them jurisdiction over the Municipal Traction Company itself and all the properties that it was operating under the lease, including the old Forest City lines, which were purchased by the Cleveland Railway Company prior to the execution of the lease. The properties comprise all the lines in the old Cleveland Electric Railway system and all the lines built by the low fare companies prior to the signing of the lease on April 27, 1908. In order to complete the system, the Neutral Traction Company was formed to build lines on Central Avenue and Quincy Street, where they had been removed by the Cleveland Electric Railway after the United States Supreme Court had declared the franchises had expired. Control of this company is owned jointly by the Cleveland Railway Company and the Municipal Traction Company or their representatives. Attorneys seem to be a little uncertain as to the status of this property. It was operated by the Municipal Traction Company, and when the receivers took over the other properties they continued the operation. Its franchise provides for a 3-cent fare, and it was expected that this would be superseded by the six tickets for 25 cents rate. The defeat of this franchise has placed it in the same position as regards fare that the other low-fare lines occupy.

Attorneys for the Cleveland Railway state that there is no significance in the fact that the condition in the lease providing that a receivership of the Municipal company would cause a reversion of properties to the Cleveland Railway had been waived. They say that the defeat of the franchise caused a forfeiture of the lease, according to the decision of the court, and that this of itself would have placed the properties in the hands of the Cleveland Railway. But the Municipal company wrongfully held possession of the properties and would not deliver them, and therefore legal proceedings were necessary to secure the rights of all. The court did not want the appointment of receivers for the Municipal to include the reversion of the properties under the agreement in the lease, and asked that this right be waived until a final hearing on all the points had been had.

The solvency of the Cleveland Railway Company was not brought into the matter, and no endeavor at the recent hearing was made to give any impression that it was insolvent. Attorneys state that the company is perfectly solvent.

A question has been raised as to the effect of the supposed bankrupt condition of Mayor Johnson upon the guaranteed stock sold by the Municipal Traction Company. He was made a party to the test suit filed some time ago by one of the stockholders, and it is expected that attorneys for the dissatisfied stockholders will make an investigation of his affairs. This condition might also have an effect on the claims of the Municipal company that the properties purchased of the Forest City Railway should be returned.

F. H. Goff, former representative of the Cleveland Railway in the negotiations with Mr. Johnson, has suggested the Chicago plan of settlement for Cleveland, with such modifications as might be deemed necessary.

The decision of Judge Tayler, of the United States Circuit Court, appointing receivers, showing over what properties the receivership extends, says in part:

"This day came on to be heard the motion of the complainant, the Central Trust Company of New York, for the appointment of a receiver or receivers herein as prayed for in its bill of complaint, and also upon motions of intervening creditors of the Municipal Traction Company whose petitions have been heretofore filed in said cause, which matter was heard upon the bill of complaint, the intervening petitions, and upon the stenographer's minutes of the proceedings in open court and the exhibits and stipulations therein referred to, and upon the evidence and exhibits and stipulations reported by the special examiner, and was argued by counsel, and upon consideration thereof, and the court being fully advised in the premises, and the counsel for the Cleveland Railway Company having stated in open court that the said Cleveland Railway Company would

not contend or claim that the leasehold interest, if any, of the Municipal Traction Company referred to in the bill of complaint was terminated or could be forfeited by the Cleveland Railway Company by reason of the order of this court appointing receivers in this cause; and the court deeming such statement by the counsel for the Cleveland Railway Company a waiver by said company of any and every forfeiture of said leasehold interest, if any, by reason of the receivership hereinafter created.

"It is ordered, adjudged and decreed that Warren Bicknell and Frank A. Scott be and they are hereby appointed receivers of all and singular the property in the possession of the Municipal Traction Company, being all of the property covered by the mortgages set up in the bill of complaint, and all other property of any and every kind and description belonging to said Municipal Traction Company, and including all street railroads, equipment and other property and assets, real, personal or mixed, of whatever kind or description, and wherever situated, leased by the defendant, the Cleveland Railway Company, to the Municipal Traction Company under the lease dated April 27, 1908, in the possession of the Municipal Traction Company or others, including all buildings, power houses and appurtenances of every kind, and all motors, cars and other rolling stock and equipment of every nature and description, and all tools, machinery, furniture, fixtures, coal, materials and supplies, and all books of account, records and other books and papers of the said Municipal Traction Company, pertaining to said property or its operation, together with all cash in banks and other moneys, and all debts, things in action, credits, stocks, bonds, securities, deeds, leases, contracts, muniments of title, bills and accounts receivable, rents, issues, profits and income accruing and to accrue as well as all leasehold interests, operating and other contracts, and all rights, interests, easements, privileges and franchises of said Municipal Traction Company; and all other assets of every kind; and that the said receivers are hereby authorized immediately to take possession of all such property, wherever the same may be found, and in the possession of whomsoever the same may be, and to run, manage and operate the said street railways and property, and, subject at all times to the orders of this court, to use, manage and conduct such business in such manner as will, in the judgment of the court, produce the best results, and to exercise the authority and franchises, and discharge the public duties appertaining thereto, and to preserve and protect the said property in proper condition and repair, so that it may be safely and advantageously used, and so that the rights of all the parties hereto and of other persons in interest may be preserved unimpaired and unaffected till the final determination by the court as to such rights; and to protect the title and possession, and secure and develop the business of the same, and to appoint, employ and discharge, and fix compensation of, officers, attorneys and employees, and to make such payments and disbursements as may be needful and proper in so doing, in order that the rights of the parties hereto and all other persons in interest may be preserved as aforesaid, and that the rights and convenience of the public may be conserved and promoted; and that the said receivers be, and they are hereby, authorized to collect the rents, income, tolls, issues and profits of said railway and property, and to make appropriate payments therefrom on account of ordinary expenses of operation and maintenance; and to do any and all other things necessary in order to continue the operation of said railways and to conduct the business thereof as authorized by this order."

Westinghouse Modified Readjustment Plan Adopted

The readjustment committee of the Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., announced on Nov. 20 that the modified or substitute plan for the readjustment of the debt of the company had been declared operative. This means that the final stage in the rehabilitation of the company has been reached, and that in all probability the company will be out of the hands of the receivers and turned over to the stockholders very soon.

The readjustment committee went into session on Nov. 17. The reports submitted by the other committees, notably the merchandise creditors' committee, the stockholders' committee and the employees' committee, were considered, and conclusions formed from the facts as presented to the readjustment committee. J. N. Jarvie, chairman of the readjustment committee, made the following statement on Nov. 20:

"The readjustment committee of the Westinghouse Electric & Manufacturing Company has declared the plan for the rehabilitation of the company's affairs operative."

Paul D. Cravath, counsel for the company, issued the following statement:

"As announced by Mr. Jarvie, the readjustment committee has declared operative the modified or substitute plan for the readjustment of the company, which plan is based upon the so-called merchandise creditors' plan. Counsel will now go ahead with the necessary proceedings for the termination of the receivership, the issue of the new securities and the restoration of the business to the company, all of which will be accomplished in the near future.

"The stockholders' meeting for the election of the new board of directors and the other actions required in the consummation of the plan will be held in East Pittsburg on Nov. 24."

It is unofficially stated that George Westinghouse will remain as president of the company, and that the directors will be James S. Kuhn, president of the First National Bank, Pittsburg; Joseph W. Marsh, vice-president and general manager of the Standard Underground Cable Company; Richard Delafield, president of the National Park Bank, New York; Albert Wiggin, vice-president of the Chase National Bank, New York; William McConway, president of the McConway & Torley Company, and a director of several Pittsburg banks; A. N. Brooker, president of the Ansonia Copper Company; A. G. Becker, Chicago; Neil Rantoul, of F. S. Moseley & Company, Boston; George Westinghouse; E. M. Herr, vice-president of the Westinghouse Electric & Manufacturing Company; Stuart Brown, Pittsburg; E. C. Converse, New York; Anthony N. Brady, New York, and George Verity, president of the Middleton Iron & Steel Company.

While the merchandise creditors agreed to accept new stock in the company in payment of their \$4,000,000 of claims, the stockholders contribute \$6,000,000 of new capital by subscribing that amount of stock at par. The employees, besides making their contribution as stockholders, accepted salary cuts ranging from 20 per cent to 7½ per cent. The company has been making money steadily since the receivership, and the profits are now \$9,000,000. This, with the \$6,000,000 cash supplied by the stock subscriptions, gives the company \$15,000,000 cash working capital, in addition to which \$6,000,000 debts have been funded. The total liabilities consisted of about \$29,000,000 funded debt and about \$15,000,000 floating debt.

Boston & Eastern Electric Railroad a Necessity

After hearings extending over a period of about two years the Massachusetts Railroad Commission has declared the proposed Boston & Eastern Electric Railroad to be a public convenience and necessity. To secure the certificate of exigency, however, the company must have recourse to the Legislature, as its plans contemplate service by a tunnel and subway not yet authorized by law. The Railroad Commission in passing on the plans of the company says in part:

"On Sept. 18, 1907, the Railroad Commission made a report upon a number of petitions then pending before it under Section 5, Chapter 516, Acts of 1906, and in connection with the petition of the Boston & Eastern Electric Railroad used the following language:

"It does not follow from what has been said that there is no call for an electric railway in the territory which lies to the north of Boston, and a carefully studied plan for such a railway has been presented by the Boston & Eastern Electric Railroad. * * *

"The plan of the Boston & Eastern Electric Railroad, though carefully studied, is not satisfactory in the way it provides for Lynn, and is fatally defective at the Boston end of the undertaking in proposing a connection with the Boston Elevated Railway at Sullivan Square.

"In our opinion no electric railway can successfully reach Boston from the north that does not secure an entrance to the city independent of the existing elevated structure in Charlestown. Without intending to define any exclusive route it may be suggested that the present tunnel or a second tunnel under the harbor might well be the connecting link.

"Our conclusion is, that while public necessity and convenience call for enterprise in this field the present route of the Boston & Eastern Electric Railroad does not meet the emergency. Its petition, however, is not dismissed, but held to await further study and development of plans by this or by any other public agency desirous of furnishing additional transportation facilities in this territory."

"The petitioner thereafter filed an amended map, profile and estimate, showing branches to Revere and Chelsea, a modification of the route in Lynn and a tunnel under Boston Harbor, with subway connection with a terminal at Post Office Square.

"The statute of 1906 authorizes, after appropriate proceedings, the construction and operation of electric railways.

The first step in these proceedings is an adjudication that public convenience and necessity require the construction of a railway of this character, and the Railroad Commission finds that such public convenience and necessity have been shown, and that the general plan as now developed by the petitioner will afford the additional facilities demanded in the densely populated territory north of Boston.

"It is agreed, however, by all parties before us, that no certificate of exigency, so called, should issue at this time, for the reason that the scheme as a whole contemplates a service by means of a tunnel and subway not authorized by existing law, and that in order to make this decision effective the petitioner must have recourse to the General Court. Petition continued."

New England Street Railway Club Meeting

The regular monthly meeting of the New England Street Railway Club was held at the American House, Boston, on the evening of Nov. 19. After the dinner, J. F. Vaughan, of the Stone & Webster Engineering Corporation, Boston, was introduced as the speaker. His topic was "The Economic Side of Water Power Development." Mr. Vaughan emphasized the adaptability of electric transmission as a distributing medium for facilitating the consolidation of scattered water powers, outlined the serious results of the policy of deforestation in the United States, and commended the work of the government in the direction of the conservation of resources. Estimates of the amount of water power not yet utilized in this country vary, said Mr. Vaughan, from 10,000,000 hp to 30,000,000 hp, the latter figure being presented by H. St. Clair Putnam at the recent Conservation Congress at Washington, who estimated that the available water power can be raised to 150,000,000 hp by storage. Mr. Vaughan said that powers formerly inaccessible can now be operated either singly or in group to advantage by hydro-electric transmission, citing the California system as an example of consolidated water powers and the Niagara system as an example of a combination of markets.

H. S. Harriman, of the Connecticut River Power Company, was then introduced. He stated that New England is behind the rest of the United States in hydro-electric development, and corroborated Mr. Vaughan as to the advantages of water storage. In the studies which his company has made of the flow of the Connecticut River, he said it has been found that the maximum flow is 100 times as great as the minimum. The conservation of even a small portion of the power lost is well worth while. At Vernon, Vt., the Connecticut River Power Company is developing a hydro-electric transmission of about 16,000 hp. A 34-ft. dam is being built which backs the water 20 miles upstream for storage. The power will be transmitted to Fitchburg, Clinton and Marlboro in Worcester County, Massachusetts, 60 miles distant, over a steel tower line at 70,000 volts with about 7 per cent loss. The capacity of the development at first will be about 16,000 hp for 12 hours per day. Mr. Harriman stated that several small water powers on the route of the line have been found which it may pay to develop and operate in connection with the larger service, but which would not be profitable if operated independently.

Suit Threatened to Compel Resumption of Service in Ohio.—City Solicitor Connaughton, of Hamilton, has been instructed by the City Council to bring proceedings against the Ohio Traction Company to declare its franchise at Hamilton, Ohio, forfeited unless it resumes service on East Avenue.

Subway Grant Applied for in Seattle.—Etlinger & Company, London, Eng., and Charles A. Debenditty, Amsterdam, Holland, have applied to the City Council of Seattle for franchises to construct 8 miles of subways in the business and residence district of that city. The plans provide for a system to cost \$6,000,000 and to be completed in less than 3 years.

Underground Crossing in New York to Relieve Congestion.—The Board of Estimate, of New York, has under consideration a plan to depress Forty-second Street at Fifth Avenue, so that the crosstown cars and the vehicular traffic passing through Forty-second Street will not interfere with the traffic on the avenue. The total cost is put at \$505,000.

Interurban Railway Opened at Pittsburg.—The Pittsburg, Harmony, Butler & New Castle Railway has been placed in operation between Pittsburg, Evans City, New Castle and Butler. The branch between Butler and New Castle has been in operation several months. It is intended to establish a limited service between Pittsburg, New Castle and Butler soon.

New Electric Railways in Ohio.—According to the report of Carmi A. Thompson, Secretary of State of Ohio, 17 street and electric railway companies, with capital stock aggregating \$1,497,750, were incorporated during the past year. In comparison with this, three railroad companies, with a combined capital stock of \$6,012,000, were granted charters. Several companies increased their capital stock, but the amount expended in improvements and extensions during the year was small in comparison with previous years. Several reincorporations, such as the Cleveland Railway, were filed, but these have not been included in the list of new companies.

Buffalo, Lockport & Rochester Railway Extended.—The Buffalo, Lockport & Rochester Railway was opened for service between Lockport and Rochester, N. Y., on Nov. 17. Connections are now being completed between the company's tracks and the tracks of the International Traction Company, Buffalo, in Lockport, and through service will soon be established between Rochester and Buffalo. The road has been in operation for some time between Rochester and Albion, and was the subject of a descriptive article which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for June 6, 1908. It will be 54 miles long and is built on a private right of way 66 ft. wide.

Public Service Commission Recommended for Connecticut.—A special committee appointed at the last session of the Legislature of Connecticut to consider the relations between the State and the public service corporations has recommended that a commission be appointed to consist of three members, to be named by the Governor and confirmed by the concurrent action of both branches of the General Assembly, to have the general supervision of all railroads, street railway, gas, electric, water, express, telephone and telegraph companies, insofar as they are subject to State Control. The salary of each of the members of the board is to be \$7,500 a year. Power to remove commissioners is to be reserved to the Supreme Court on written complaint by the Attorney General after a hearing.

Philadelphia Bus Company Suspends.—The Auto Transit Company, which has operated a line of automobile coaches and omnibuses on Broad and Diamond Streets, Philadelphia, for more than a year, was placed in the hands of the Commercial Trust Company and George McCurdy, president of the Common Council, as receivers, on Nov. 18. They withdrew the coaches and omnibuses from service at once. Peter J. Hughes, vice-president and general manager of the company, said: "The company has gone into the hands of receivers because its expenditures were in excess of its receipts. The public would not pay the price to maintain this electric automobile service, many citizens' and business men's associations, assuming that the company could operate at a 5-cent fare."

Amicable Adjustment of Ohio Dispute.—An agreement has been reached between the village of Delhi and the Cincinnati, Lawrenceburg & Aurora Electric Street Railway regarding the company's obligation to maintain the streets through which it operates in Delhi. The franchise grant of the company was repealed some time ago, and the village authorities had a section of the company's track torn up. The company then secured a temporary restraining order. When the case came before the court an agreement was reached under which the injunction is to be made perpetual and the Village Council is to rescind its action in regard to revoking the franchise, the company is to keep the streets in repair and all matters in dispute are to be reported to the court. Each side pays half of the court expenses.

Preparations for Opening Washington Street Tunnel, Boston.—Final preparations are being made by the Boston Elevated Railway for opening the new rapid transit tunnel under Washington Street, and it is possible that service will begin in the new tube before Dec. 1. Many of the final changes in tracks will be effected at night, notably those at the northern incline of the tunnel and subway, where a rapid shift in connections will have to be made before the elevated trains can be run through the new tunnel and up the northern incline to the North station. A shuttle service is to supplant the present loop service between the North station and the South station, and the track connections for this have been practically finished. The loop for surface cars running through the Tremont Street subway is practically completed at the North station, and only a short stretch of track remains to be laid at the Pleasant Street station to permit the surface cars once more to enter the subway from the South End. Six-car trains will be run over the elevated upon the opening of the tunnel, many of the elevated stations having been lengthened to accommodate the long trains. The surface car schedules will also be regulated to meet the requirements imposed by the new subway line.

Financial and Corporate

New York Stock and Money Markets

NOVEMBER 23, 1908.

The course of the stock market during the week past has been downward, with unsettled conditions. The truth of the matter is that public buying has fallen off very perceptibly, and there is some evidence that those insiders who held long lines of securities which were accumulated last spring, have been selling for profit. The volume of sales has slowly decreased, and altogether there is less activity than a week ago. So far as appearances go, it does not seem that there has been any concentrated bear movement. The selling appears to have been with legitimate profit taking by actual holders. The only cause for apprehension in the present conditions is that it may be destructive to confidence in the general public. This has been slowly building up for months and came to its culmination immediately after the election. During the summer and spring there was little or no outside buying, and such buying is necessary to healthy conditions of trading in Wall Street. With the absence of bear manipulation, however, it is to be hoped the public will take no alarm.

In the meantime all of the natural conditions which should affect the stock market are favorable for a continued advance or at least for the maintenance of prices at the present level. The returns from the crops, which are no longer matters of guess or estimate, are known to be bountiful. Every producing section of the country is in good condition, because the farmers and the banks have money. The average yield of the fields was plentiful and the average prices received for the farmers' wares are high. Business is better in all commercial lines; more operatives are at work in mills and factories, and more money is ready to seek investment in legitimate business.

There appears to be a strong and urgent demand for good bonds. The course of stocks appears to have no effect upon this demand. The Panama issue and the New York City issue were both over-subscribed, and there is every evidence that there is plenty of money left for other issues that may offer.

Money remains cheap and was quoted to-day at 1¼ to 2 per cent for call loans and 3 to 3¼ per cent for 90-day paper.

Other Markets

In the Boston stock market the interest in traction securities was confined almost exclusively to Massachusetts Electric issues. Both the common and preferred were fairly active, the former selling at 113¼ and the latter at 55 to 58, the close being at the high figure. Boston Elevated sold at 120½.

Chicago Railways, Series 2, has been the most active traction issue in the Chicago market during the past week. The prevailing price was from 44 to 45. Chicago Subway sold in small quantities at 21¾ to 22.

In the Philadelphia market there continued to be considerable trading in tractions. Rapid Transit was a trifle more in demand than during the previous week and closed at 22¾. Philadelphia Electric sold at 11¾ and Philadelphia Traction at 89. Union Traction was active at 49¾ to 50¼.

Bonds continue to be the favorite traction securities in the Baltimore trading. Baltimore Electric 5s sold at 86½. North Baltimore Railways at 115½, United Railway 4s sold at 85¾, the incomes at 54 and the funding 5s at 83.

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

	Nov. 17.	Nov. 23.
American Railways Company, Philadelphia.....	46	46
Boston Elevated Railways.....	126¼	129½
Brooklyn Rapid Transit Company.....	55½	53¼
Chicago City Railway.....	180	185
Cleveland Railway.....	—	—
Consolidated Traction Company of New Jersey.....	a71	a73
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a104	a104
Detroit United Railway.....	56	53½
Interborough-Metropolitan Company.....	14¾	13½
Interborough-Metropolitan Company (preferred).....	35¾	34¾
Manhattan Railway.....	144	142
Massachusetts Electric Companies (common).....	11½	11¾
Massachusetts Electric Companies (preferred).....	57	58
Metropolitan West Side Elevated Railway, Chicago (common).....	a20	a17
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a45	a44
Metropolitan Street Railway.....	31¾	*30¾
North American Company.....	73	72¾
Philadelphia Company, Pittsburg (common).....	41¾	41½
Philadelphia Company, Pittsburg (preferred).....	42½	42
Philadelphia Rapid Transit Company.....	21½	22¾
Philadelphia Traction Company.....	88½	89
Public Service Corporation, 5 per cent collateral notes.....	a97½	a97½
Public Service Corporation certificates.....	a74	a74
Twin City Rapid Transit Company, Minneapolis (common).....	95½	94½
Union Traction Company, Philadelphia.....	49¾	49¾

a Asked.
* Last sale.

Earnings of Interborough Rapid Transit Company

The report of the Interborough Rapid Transit Company, New York, as filed with the Public Service Commission of the First District of New York for the quarter ended Sept. 30, 1908, compares as follows:

	1908.	1907.
Gross receipts.....	\$5,328,887	\$5,155,127
Operating expenses.....	2,675,709	2,618,566
Net earnings.....	\$2,653,178	\$2,536,561
Receipts from other sources.....	337,175	289,580
Total income.....	\$2,990,353	\$2,826,141
Interest on funded debt.....	500,000	275,000
Property taxes.....	87,627	94,508
Special franchise taxes.....	310,000	260,000
Balance.....	\$2,092,726	\$2,196,633
Rentals.....	1,998,429	1,989,542
Discount and expenses.....	3,108	.....

Surplus..... \$91,189 \$207,091

The income accounts of the two divisions of the company showing the amount contributed by each toward the quarter's earnings follow:

	Manhattan (Elevated) Division.	Subway Division.
Gross receipts.....	\$3,093,838	\$2,235,049
Operating expenses.....	1,587,198	1,088,511
Net earnings.....	\$1,506,640.	\$1,146,538
Receipts from other sources.....	129,330	207,845

Total income.....	\$1,635,970	\$1,354,383
Interest on funded debt.....	.....	500,000
Property taxes.....	72,627	15,000
Special franchise taxes.....	310,000	.....

Balance.....	\$1,253,343	\$839,383
Rentals.....	1,462,656	535,773
Discount and expenses.....	.....	3,108

Surplus..... *\$209,313 \$300,502

*Deficit.

Foreclosure Suit in New York Brought to Trial

The suit of the Guaranty Trust Company to foreclose the collateral trust mortgage made by the Metropolitan Street Railway, New York, in 1897, came to trial before Judge Lacombe, in the United States Circuit Court, on Nov. 19, as the first legal step looking to the eventual reorganization of the company. This suit is coupled with that of the Morton Trust Company to foreclose the refunding mortgage of the Metropolitan Street Railway, dated 1902. The refunding mortgage of 1902 is a second mortgage upon much of the collateral pledged under the earlier mortgage of 1898. On other property and other securities it is a first mortgage.

The testimony taken at the hearing on Nov. 19 was largely of a perfunctory character, and related to the authorization of the mortgage of 1897 and the facts about the defaults on interest payments. Some of those who have filed cross bills to have the property sold under the mortgage held by the Guaranty Trust Company said that their claims had a priority and asked the court that they be settled before the property is taken out of the hands of the receivers. Judge Lacombe said, in response to this petition, that the suit was proceeding on the theory that the testimony would warrant the sale of the property foreclosure to satisfy the mortgage held by the Guaranty Trust Company. He concluded: "The priority of various other liens and claims of contract and other creditors will be determined after the sale. Whoever purchases the property will have to make good the valid claims of the contract creditors and those entitled to relief after such claims have been litigated. If the purchasers do not make good such claims the property will be taken out of their hands."

It was learned that the reorganization committee, representing both bondholders' committees previously existing, is disposed to look upon the ultimate question of reorganization much as the bondholders' committee did, and believes that any attempt would be futile if made before an authoritative statement is obtained of what the roads can earn when in fair operating condition. Consequently, the improvements made by the receivers of the company out

of the proceeds of the receivers' certificates will be allowed to show their effect upon the earnings of the company before the reorganization question becomes a practical one. Likewise, it is said that the rights of the Public Service Commission to enforce its orders will be finally tested in the courts before the details of the reorganization are worked out, as the rulings of the commission compelling the restoration of transfers, if sustained, would seriously affect the earnings of the company.

Boston (Mass.) Elevated Railway.—At a special meeting of stockholders of the Boston Elevated Railway on Nov. 17, it was voted to authorize the directors to issue not exceeding \$6,650,000 capital stock at a price of \$110 per share, subject to approval of the Railroad Commissioners. Of this amount, 55,000 shares will issue to provide funds for the construction and equipment of the proposed Cambridge subway, and 11,500 will issue for the purpose of construction and equipping the elevated railway, authority for which was granted by the same act of the Legislature. Stockholders previously authorized the rescinding of the vote of April 13, 1907, which provided for the issuance of \$8,000,000 capital stock at a price to be determined by the Railroad Commissioners. The \$6,650,000 new stock will bring the total stock authorized up to \$19,950,000.

Camden & Trenton Railway, Camden, N. J.—Chancellor Pitney has filed an opinion, granting to the Provident Life & Trust Company, Philadelphia, trustee for the bondholders of the Camden & Trenton Railway, the right to file a bill of foreclosure in the United States Circuit Court and to proceed thereon against the receiver as well as against the Camden & Trenton Railway and other parties, to a decree for a foreclosure and sale. The opinion, however, says that this leave shall not extend to interfere with the present receivership or disturb the possession or control of the receiver, or his management of the company, nor shall it extend to permit an application to be made for the appointment of a receiver in the foreclosure suit without the further orders of the United States Circuit Court.

Chicago (Ill.) Consolidated Traction Company.—Suit has been brought by the bondholders' committee of the Chicago Consolidated Traction Company in the Superior Court to hold the Chicago Railways Company, as successor to the Chicago Union Traction Company, responsible for the interest on the defaulted bonds of the Chicago Consolidated Traction Company. The committee representing the 4½ per cent general mortgage bonds of the Chicago Consolidated Traction Company announces that more than a majority of the \$6,750,000 bonds have been deposited under the agreement and that the time for the deposit of the remainder of the bonds has been extended until Dec. 14.

Montgomery (Ala.) Traction Company.—Control of the Montgomery Traction Company has passed from the Philadelphia syndicate, which has owned and operated the property since December, 1905, to Richard Tillis, Montgomery, and associates.

Port Jervis Electric Light, Gas, Power & Railroad Company, Port Jervis, N. Y.—Justice Morschauer, of the Supreme Court of New York, has appointed James G. Graham, Newburg, referee to compute the amount due on the mortgage held by the Knickerbocker Trust Company, New York, as trustee for the bondholders of the company in the matter of proceedings for foreclosure and sale already instituted.

Susquehanna Railway, Light & Power Company, Lancaster, Pa.—The Susquehanna Railway, Light & Power Company reports as follows for the year ended June 30, 1908: Receipts from subsidiary companies, etc., \$551,479; interest on bonds, dividends on stocks of subsidiary companies, \$224,980; balance available for dividends, \$306,499; dividends, \$131,632; undivided surplus, \$174,827. The company owns the capital stock of the United Gas & Electric Company and the Lancaster County Railway & Light Company, which control 18 railway, light, power and gas plants in different parts of the United States.

Toledo, Ann Arbor & Detroit Railroad, Toledo, Ohio.—The completed roadbed of the Toledo, Ann Arbor & Detroit Railroad, extending from the Ohio and Michigan line to Ann Arbor, Mich., and the other property of the company in Michigan, were bid in at master's sale in Toledo on Nov. 16 for \$60,000 by Curtiss M. Steudell and Valentine H. Sorghner, of Chicago, representing a Chicago syndicate. The purchasers state that the road will be completed and that a portion of it will probably be in operation by February, 1909. An endeavor will be made to buy the property of the company in Ohio on which some work has been done, but if the purchase cannot be concluded a new entrance to Toledo will be sought.

Traffic and Transportation

Arguments on Transfer Case in New York

Arguments were made before the Appellate Division of the New York Supreme Court on Nov. 20 in the case resulting from the order of the Public Service Commission, First District, to the Central Park, North & East River Railroad and the Metropolitan Street Railway to establish joint fares and through routes.

O. C. Semple, on behalf of the commission, asked the court to vacate an order for reviewing the action of the commission in restoring transfers on the ground that the court was without jurisdiction and that the acts of the commission are not reviewable in such circumstances. Mr. Semple said:

"There is no statute expressly conferring the right to the writ of certiorari for the purpose of reviewing the order of the Public Service Commission in this case, and such writ could not be issued at common law to review such an action.

"The Public Service Commission is an administrative body exercising powers delegated to it by the Legislature which might have been exercised by the Legislature itself, but which the Legislature may lawfully delegate.

"If any action of the commission is claimed to be invalid for the reason that the law is unconstitutional or the action is in excess of the jurisdiction or powers vested in the commission by law the railways have remedies."

Judge Houghton referred to the fact that there had been a court review provision in the former railroad law, and asked for light as to what had become of such right under the Public Service Commission, as successor to the old Railroad Commission.

Mr. Semple explained that the present commission, while it has practically all the powers of the former party, has many additional powers and rights, one of which is freedom from direct court review. In response to a query by Judge Scott, Mr. Semple declared that it was not maintained that its acts were not subject to any form of review, but that the certiorari proceedings were not the proper procedure.

The United States Supreme Court, Mr. Semple said, had held that a proper proceeding would be one in equity to restrain the commission, this having been held in the 80-cent gas case.

Robert C. Beatty, of counsel for the Metropolitan system, contended that all the acts of the commission were semi-judicial and subject to review.

"The people whose property is affected by order of the commission have their rights, their day in court," said Mr. Beatty. "The order goes into effect Sunday, and the penalty will cost the company \$150,000 per month if not obeyed. It is absurd for the other side to say we cannot defend."

Decision was reserved by the court.

Problems in Operation of a Large City Railway

Because the Pittsburg Railways Company has been unwilling to modify its service in accordance with a plan proposed by George W. Guthrie, Mayor of Pittsburg, the company has been threatened by the Mayor with a suit to determine the right of the city to make and enforce rules governing the operation of cars within the city limits. In a statement to the public in reply to Mayor Guthrie, J. H. Reed, president of the Philadelphia Company, which controls the Pittsburg Railways Company, says in part:

"While I have a high regard for Mayor Guthrie's ability, I do not believe he can manage this intricate business quite as efficiently as James D. Callery, president of the Pittsburg Railways Company, with his years of experience. I am very sure I would make a mess of it, and I think the Mayor would also. The history of municipal control of public service companies has been disastrous from a financial standpoint as well as from the standpoint of satisfactory service to the public. The business is severely practical and cannot be run by theorists, however well meaning. If the Mayor can devise any plan to accommodate, without crowding the multitudes in every large city that start for home at the same time in the evening and insist on getting into the first car that comes along, although their transportation into the city has been spread over several hours' duration the early part of the day, he will earn undying fame as well as a large revenue from his invention. This problem will fully occupy him without undertaking to break up the existing service, and his solution in a practical manner will be joyfully received by street railway managers."

Accident on A., B. & C. Railway in Ohio.—Eight men were seriously injured and at least 20 others slightly hurt at Cleveland, Ohio, on Nov. 23, when a car of the Akron, Bedford and Cleveland branch of the Northern Ohio Traction & Light Company, backing down the grade at Baxter Avenue on Broadway, crashed into an ascending Broadway car which was following it.

Complaint Against Service on the Old Colony Street Railway.—A petition has been presented to the Massachusetts Railroad Commission by Jos. E. Greensmith and citizens of Taunton, Mass., asking that the Old Colony Street Railway be directed by the commission to modify service in that city in accordance with plans which the petitioners feel will benefit the citizens of Taunton. A hearing has been ordered for Dec. 8.

Coney Island & Brooklyn Railroad Complies with Circuit-Breaker Order.—S. W. Huff, president of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., informed the Public Service Commission of the First District of New York on Nov. 19, that all the winter cars have been equipped with two circuit-breakers and that all the open cars are being equipped with two breakers for service next summer, in accordance with an order issued by the commission last summer. After hearing Mr. Huff's explanation, Commissioner Bassett said he would recommend that the action brought in the Supreme Court against the company to recover \$5,000 for failure to comply with the order be discontinued.

Expectorating in Cars to Be Made Punishable in Pennsylvania.—The State Department of Health is co-operating with L. C. Bradley, general superintendent of the Eastern Pennsylvania Railways Company, Pottsville, Pa., in the latter's efforts to have a State law enacted making it a misdemeanor to spit on the floors of electric cars, a practice which is prevalent in cars operated in the mining regions and manufacturing districts. State Health Commissioner Dixon has promised to have an order promulgated by his advisory board making the offense a misdemeanor, and will introduce a bill at the next session of the Legislature to make spitting in cars punishable, as it is impossible to secure a conviction in the absence of a general law. The new law will be drawn so as to give car crews police powers with authority to make arrests for any disorder or disobedience on the cars.

Suit by New York Public Service Commission to Recover for Non-compliance with Its Order.—The Public Service Commission of the Second District of New York has brought an action in the Supreme Court to recover \$47,000 as penalties for the failure of the Port Jervis Electric Light, Gas, Power & Railroad Company, Port Jervis, N. Y., to comply with the order of the commission made on May 12, 1908, requiring that certain physical improvements be made to its property. The company has filed an answer in which it admits its non-compliance with the commission's order, but states that it was without resources to carry out the work, that pending proceedings with the Public Service Commission an application was made for permission to abandon its Kingston Avenue branch, and that a hearing took place on the matter on July 2, 1908, at which the company stated that it had not raised the money to comply with the provisions of the order issued on May 12.

Joint Hearing on Fare Between New York and Yonkers.—Leslie Sutherland, receiver of the Yonkers (N. Y.) Railway, has been notified by the Corporation Council of Yonkers to discontinue the operation of cars on Elm and Walnut Streets, South Broadway, Nepperhan Avenue, Yonkers Avenue, Bronx River Road and Park Avenue, because on Oct. 17 he increased the fare between New York and Yonkers from 8 cents to 15 cents and refused to recognize the transfer agreement between the Yonkers Railroad and the Union Railway, New York. A week later the Board of Aldermen of Yonkers notified Mr. Sutherland to restore at once the 8-cent fare between New York and Yonkers or proceedings would be taken to annul the franchises. The receiver proposed a compromise agreement calling for a 5-cent fare to the subway and elevated terminals in New York, but it was refused by the Aldermen, and the Corporation Council of Yonkers was directed to take steps to have the franchise forfeited and to collect the \$50,000 bond deposited with the city by the Metropolitan Surety Company as a guarantee of the faithful performance by the railroad of its franchise agreements. As a result there will be a joint hearing on Nov. 27, by the Public Service Commission of the First District of New York and the Public Service Commission of the Second District of New York, on complaint of Mayor Warren, of Yonkers, against the discontinuance of the joint rate on through lines between Yonkers and New York.

Personal Mention

Mr. W. H. Ragland has resigned as general manager of the Montgomery (Ala.) Traction Company and Mr. W. J. Ginnivan has been appointed as his successor.

Mr. A. B. Coryell, formerly general manager and purchasing agent for the Huntsville Railway, Light & Power Company, Huntsville, Ala., has been appointed electrical engineer and purchasing agent for the Huntsville, Chattanooga & Birmingham Interurban Railway, Light & Power Company, Huntsville, Ala.

Mr. Charles H. Bigelow, formerly of Boston, Mass., who during the past Summer has been connected with the Public Service Commission of the First District of New York as a mechanical expert in the work of determining the physical value of the property of the New York City Railway under the direction of Mr. Bion J. Arnold, is now completing the construction of a 3000-h.p. hydro-electric plant at West Point, Ga., for the Chas. T. Main Mill Engineering Company, Boston, Mass.

Mr. Waldo G. Paine, who was recently appointed traffic manager of the Spokane & Inland Empire Railroad, Spokane, Wash., was one of the original incorporators of the Cœur d'Alene & Spokane Railway, which was merged into the Inland Empire System in 1906, and was formerly traffic manager of the company. He became general passenger agent of the Spokane & Inland Empire Railroad three years ago. Following the resignation of Mr. J. H. Lothrop, the general freight agent of the company, on Nov. 1, the freight and passenger divisions were merged, and Mr. Paine was appointed traffic manager.

Mr. C. M. Graves, who on Nov. 1 was appointed general manager of the Spokane & Inland Empire Railroad, Spokane, Wash., is a son of Mr. J. P. Graves, president of the company, and was formerly president and general manager of the Spokane Traction Company before it became a division of the Spokane & Inland Empire Railroad. About 2½ years ago Mr. C. M. Graves was elected president of the Cœur d'Alene & Spokane Railway, and served in that capacity until his appointment to the Spokane & Inland Empire Railroad. Mr. Graves' experience covers the various phases of city, suburban and interurban railroad management.

Mr. John W. Ogden, Maynard, Mass., has been appointed an inspector of the Railroad Commission of Massachusetts and assigned to the district of Mr. Grafton Upton, resigned. Mr. Ogden began his railroad career with the Boston, Clinton & Fitchburg Railroad in 1879, where he remained 11 years, during which time he served as clerk in the superintendent's office, station agent and telegraph operator. In 1894 he entered the service of the Clinton (Mass.) Street Railway, and for four years was engaged in construction and repair work to track and overhead line. In 1898 Mr. Ogden was appointed superintendent of the Worcester & Clinton Street Railway, Worcester, Mass. Subsequently he was made superintendent of the Clinton & Hudson Street Railway in addition to superintendent of the Worcester & Clinton Street Railway. When these properties were merged into the Worcester (Mass.) Consolidated Street Railway Mr. Ogden became superintendent of the Concord, Maynard & Hudson Street Railway, Maynard, Mass., his duties being later extended to include the management of the Lowell, Acton & Maynard Street Railway. He will relinquish these positions on Dec. 1 to become inspector for the Railroad Commission.

OBITUARY

James Goodwin, manager and purchasing agent of the Power, Transit & Light Company, Bakersfield, Cal., is dead.

Guerdon Saltonstall Howe, of the legal department of the Boston (Mass.) Elevated Railway, is dead. Mr. Howe was born in Haverhill, Mass., on Nov. 30, 1866. He was educated in the public schools of Haverhill and entered Harvard in 1885. He was graduated from that institution in 1899 and then entered the Harvard law school.

A. V. Schroeder, secretary and general manager of the Winona Railway & Light Company, Winona, Minn., since July 1, 1907, is dead. Mr. Schroeder was a native of Kansas and a graduate of the University of Kansas and of the University of Wyoming. Prior to his connection with the Winona Railway & Light Company he was for several years manager of the Decatur Railway & Light Company, Decatur, Ill. Two years ago he entered the service of the Lacrosse Water Power Company, from which he resigned to become manager of the Winona Railway & Light Company. Mr. Schroeder is survived by a widow and three children.

Construction News

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

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

FRANCHISES

***Berkeley, Cal.**—Application has been made to the Board of Trustees by Duncan McDuffie for street railway franchises on rights of way included in the applications, made by the Southern Pacific Company.

San Diego, Cal.—The City Council has passed an ordinance awarding a franchise to the Point Loma Railway to operate for a period of 25 years a street railway, commencing at the intersection of southerly line of Wright Street with Hancock Street.

Atlanta, Ga.—The General Council has adopted a resolution extending the time of the Georgia Securities Company, to commence building an electric railway from Atlanta to Macon, for 30 days. [E. R. J., Oct. 17, '08.]

Cairo, Ill.—The City Council has granted to the Cairo & St. Louis Railway a 50-year interurban franchise and a 20-year street railway franchise. As a result of the grants, it is said that the Illinois Traction Company will purchase the street railway, electric lighting and gas plants of Cairo from the Halliday interests and will begin at once the construction of an interurban road to Mound City or Mounds. The interurban is chartered to run between Cairo and St. Louis. [E. R. J., Oct. 10, '08.]

Richmond, Ind.—It is stated that the Dayton & Western Traction Company has accepted a franchise from the city, which provides for the stopping of the cars at every corner to take on and discharge passengers and also give transfers. The franchise permits the company to operate freight cars through the city.

***Parsons, Kan.**—Cyrus E. Meade, Toledo, Ohio, has been granted a franchise to build a street railway in Parsons.

Morristown, N. J.—The Board of Freeholders has granted a franchise to the Morris County Traction Company to build its line on the county roads in Hanover Township.

Islip, N. Y.—The Town Board has granted the application of the South Shore Traction Company, Patchogue, N. Y., for an alteration to its franchise. The company expects to begin on April 1 the construction of its lines, and will complete and put in operation within a given time a branch road running from Main Street, Sayville, down Candee Avenue to the Bay.

Waxahachie, Tex.—Howard M. Hyatt, secretary of the Empire Construction Company, Kansas City, and A. C. Harrington, civil engineer for the company, have secured a franchise for the construction and operation of an interurban railway through Waxahachie. The franchise covers a period of 25 years. The line is to be built from Dallas via Waxahachie and Cleburne to Fort Worth. A franchise through Cleburne was secured some time ago. [E. R. J., July 4, '08.]

Rutland, Vt.—The Rutland Railway, Light & Power Company has asked permission of the Board of Aldermen to extend its line from the present terminus of the tracks on South Main Street along this street to the city limits. George S. Haley, general manager.

***Centralia, Wash.**—W. H. Patterson and A. Welch, who are identified with the electric railway system at Vancouver, Wash., and Theodore Moss, have applied to the City Council for an electric street railway franchise. It is said to be the intention of the applicants to operate in Centralia, to extend their line and connect with Chehalis.

Seattle, Wash.—The Seattle Electric Company has recently applied to the City Council for a 25-year street railway franchise from Fourteenth Avenue south and Jackson Street to Rainier Beach, paralleling the route of the Seattle, Renton & Southern line. The proposed franchise also gives the Seattle Electric Company the privilege of building from Thirty-seventh Avenue south and Rainier Avenue south to Edmunds Street and make connection with the route first proposed.

Pewaukee, Wis.—The Milwaukee Western Electric Railway has applied to the Village Board for a franchise to build a line through Pewaukee. The road when completed will connect Milwaukee, Wauwatosa, Brookfield, Pewaukee, Hartland and Beaver Dam.

RECENT INCORPORATIONS

***Craggs & Canon Railway, Denver, Col.**—Incorporated in Colorado to build a standard gage railway from the town of Craggs on the Moffat road to Eldorado Springs, thence to

Boulder. The final survey from Craggs to Eldorado Springs, with a maximum grade of 4 per cent, has been established, and the line from Eldorado Springs to Boulder will not exceed a maximum of 1 per cent. The line finally determined upon starts from Craggs station on the Moffat road, winding around Craggs Mountain by way of Craggs resort, down the Quartz Creek and South Boulder canons to Eldorado Springs. Capital stock, \$300,000. Incorporators: George F. Keller, Fort Wayne, Ind.; L. B. Bradley, Chicago; G. A. Brink, D. C. Nevin and N. S. Williams, Denver.

Clarksville (Ga.) Railway.—This company has been chartered in Georgia to establish a street railway system in Clarksville. Capital stock, \$10,000. Incorporators: E. S. Hunnicutt and Robert McMillan. [E. R. J., Oct. 10, '08.]

Burghaw Interurban Company, Burlington, N. C.—This company has been incorporated to build and operate an electric railway between Burlington, Graham, Haw River and other points near Burlington. Capital stock, \$500,000. Incorporators: C. E. W. Tenney, New York; F. S. Jones, Nashville, Tenn., and E. S. W. Dameron, Burlington. [S. R. J., Dec. 28, '07.]

Hamilton, Ont.—Notice has been given of an application to the Legislature, at its next session, for an act of incorporation of the Desjardins Interurban Railway. The route outlined is from Hamilton by Dundas to Galt, and from Hamilton through Burlington Heights, through Waterdown to Campbellville, and then to Guelph. Another proposed line runs to Burlington. The company desires the privilege of issuing bonds or other securities to the extent of \$25,000 per mile, and to grant running rights to other companies.

***Banksville & West End Street Railway, Pittsburg, Pa.**—A charter for this company, organized for the purpose of constructing and operating a street railway, from the Banksville road at the Allegheny County boundary line through Banksville and to a point beyond the dividing line of Union and Scott townships, has been applied for. The applicants for the charter are W. E. Kusen, A. J. Schmidt, C. August Steutz, W. P. Heckman and J. D. C. Miller.

***Delaware Tunnel Railroad, Philadelphia, Pa.**—Chartered to build two tunnels running under the Delaware River, from Second and Market Streets, Philadelphia, to Third Street, Camden. The tunnel cars will run to the eastern limit of Camden by a new elevated which will be built at the same time. The fare from any point in Camden across the river will be 5 cents. Capital stock, \$10,000. Incorporators: William A. Stern, Isaac Silverman, Benjamin Wolf, Edwin Wolf, Mr. Wagner and A. W. Freeman, all of Philadelphia.

TRACK AND ROADWAY

Montgomery (Ala.) Traction Company.—Within about six weeks this company plans to award contracts for the building of 5000 ft. of double track on Dexter Avenue. A 70-lb. 7-in. girder rail will be laid.

Heber Light & Traction Company, Heber, Ark.—The ELECTRIC RAILWAY JOURNAL is advised that this company, which holds the franchise for a street railway in Heber, is now surveying a route. The line will be about 1½ miles in length. It is proposed to operate gasoline motor cars, but later on the road will be electrified. Capital stock, \$50,000. Officers: Dr. C. F. Crosby, president; R. T. Martin, vice-president; W. L. Thompson, secretary; H. F. Fix, treasurer; W. H. Horton, general manager, all of Heber. [E. R. J., Oct. 24, '08.]

Russellville Water & Light Company, Pine Bluff, Ark.—This company has been organized to take over the franchise of the Russellville & Ozark Mountain Light & Transit Company, which was organized in June, 1907, with a capital stock of \$200,000, for the purpose of constructing a light and water plant at Russellville and an interurban line between Russellville and Dover. The new company has been organized with a capital stock of \$1,000,000, of which \$51,000 has been paid in. Officers: A. Brewster, president; C. S. Bacon, vice-president; Garland Brewster, secretary and treasurer. Offices of the company will be in Pine Bluff. [S. R. J., Aug. 17, '07.]

Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.—This company has moved its general offices from Hanford, Cal., to the city of Fresno, and is now located in the Hughes Hotel block. F. S. Granger, general manager of the company, states that the rights of way are about completed, and all the franchises in the several towns and cities through which the road passes have been granted. The company hopes to begin construction not later than Jan. 1, 1909.

Oakland (Cal.) Traction Company.—It is reported that this company proposes to rebuild and broad-gage its San Jose Avenue line in Alameda.

Colorado Interurban Railroad, Denver, Col.—C. H. Pierce, general counsel for this company, which has projected a system of electric lines between Denver and Greeley, is said to have announced that \$1,300,000 had been raised for the work. The Eastern stockholders are expected to arrive in Denver the last of the month, when it is thought that the additional \$700,000 needed to complete the road will be subscribed in Colorado. [E. R. J., Oct. 31, '08.]

City & Suburban Railway, Washington, D. C.—The Commissioners have approved the application of this company to change the alignment of its tracks in the vicinity of Florida Avenue and First Street northeast, thereby making it possible to remove the present tracks of the company in First Street northeast between New York and Florida Avenues and in Florida Avenue from First Street to Eckington Place. In lieu of this old route the Commissioners will permit the company to extend its tracks from the intersection of New York Avenue and First Street through square 709, which is bounded by New York Avenue, Florida Avenue and First Street.

Daytona, Fla.—S. H. Gove, Daytona, general manager of the American Trackless Trolley Company, writes that it is expected to begin construction work in about 30 days on the electric trackless trolley system, which is to connect Seabreeze and Daytona Beach. A franchise has already been secured from Seabreeze, and the franchise from Daytona is now pending in the City Council. Capital stock, \$200,000. [E. R. J., Nov. 14, '08.]

Dixon, Rock Island & Southwestern Electric Railway, Tampico, Ill.—Burns & Company, Isabel Building, Chicago, report that the work of grading the first 12-mile section on this proposed railway, between Sterling and Rock Island, Ill., has been about completed. The work of laying the steel will begin at Tampico and extend west to Hoopole, Ill., at once. The company plans to complete this 12-mile section as soon as possible, and operate it as a steam railway until the second connecting link of the line is completed. Burns & Company, Chicago, have general charge of the purchasing of material and the building of the line.

Kankakee (Ill.) Electric Railway.—B. M. Rollins, manager of this company, writes that 2 miles of track will be added to the system the coming season.

Ft. Wayne & Springfield Railway, Decatur, Ind.—This company expects to place contracts during the next two months for the construction of a 12-mile extension, also for 70-lb. rails for this new line. Construction work is to be started next spring.

Newton, Kan.—A. M. Rose and Olcott Payne, of New York, are reported to be interested in a plan to build an electric railway running to Wichita on the south and as far as Salina on the north, with perhaps shorter lines connecting with Hesston and Moundridge as well as the other towns nearby.

Alexandria (La.) Electric Railway.—I. B. White, superintendent, writes that this company will place contracts during the next two weeks for overhead material for a 2-mile extension.

Mexico (Mex.) Tramways.—This company is now electrifying sections of its line in both Mixcoac and Tacubaya, in all about 1¼ miles in length. The new line will be devoted entirely to the freight business, and is put in commission in order to facilitate the shipments of stone from the quarries of Tizapam and San Angel and Mixcoac.

Missoula, Mont.—It is reported that W. A. Clark, W. A. Clark, Jr., W. M. Bickford and A. H. Wethey, Butte, are interested in a proposition to establish a street railway system in Missoula.

New York, N. Y.—The application of the New York, Westchester & Boston Railway to make such changes in its route as will permit of connections with the New Haven road, as well as to run the new line by the overhead trolley system and for extensions of time in which to complete that part of the work which lies within the city lines, was granted this week by the Board of Estimate. The company gets until August, 1911, to finish building its line from the city boundary to 174th Street, and until August, 1913, to complete the construction of the section from 174th Street to the Harlem River.

Rochester (N. Y.) Railway.—General Manager E. J. Cook, of this company, has issued a statement giving the construction work done by the company during the present year. On the city lines the company has spent \$315,000 in improvements and \$95,000 has been spent on the interurban lines. At present the mileage of the company in the city is 104 miles. This year 22.2 miles were added.

Western Ohio Railway, Lima, Ohio.—M. M. Baxter, electrical engineer, recently has completed rebuilding 20 miles

of this company's high-tension transmission system. As originally built the line comprised three stranded aluminum cables. These have been replaced by solid wires of higher tensile strength. The new conductors are of aluminum with a steel core. The work of replacing was carried on at night in three-hour periods. The new solid wires were drawn into place in sections by withdrawing the old stranded cable by an electric locomotive. In this way the replacement was carried on without interfering with regular operation.

Johnstown & Gallitzin Railway, Johnstown, Pa.—G. U. G. Holman writes that this company intends to begin construction work next spring on its projected road, which is to connect Johnstown, Dale, Walnut Grove, Geistown, Elkton, Salix, Lovett, St. Michaels, South Fork, Summerhill, Wilmore, Portage, Lilly and Gallitzin. It will be a standard-gauge road and will have about 32 miles of track. This company is the successor to the Johnstown, Ebensburg & Northern Railroad. Electricity will be the motive power. Capital stock, authorized, \$200,000, issued, \$70,000. Headquarters, Suppes Building, Johnstown. Officers: Wallace Sherbine, president; Alian Sherbine, secretary; H. W. Story, treasurer; G. U. G. Holman, general manager and electrical engineer. [E. R. J., Sept. 26, '08.]

Morgantown & Dunkard Valley Traction Company, Morgantown, W. Va.—A meeting of citizens of Mt. Morris will shortly be held to hear the report of the committee which interviewed officials of this company relative to further extending its line 6 miles from Stumptown, W. Va., to Mt. Morris, which is situated about 10 miles from the Monongahela River and a like distance from the railroad station. The Morgantown line is now being built from Morgantown, W. Va., through Blocksville to Mannington, and has already been completed almost to Stumptown.

Milwaukee Western Electric Railway, Milwaukee, Wis.—Surveyors for this company are surveying from Beaver Dam to Milwaukee, via Juneau, Rolling Prairie, Minnesota Junction, Hustisford, Neosho, Alderly and Oconomowoc. Options have been secured on the right of way between Beaver Dam and Neosho. The total length of the road as projected will be 106 miles.

POWER HOUSES AND SUBSTATIONS

Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind.—This company expects to remodel its power station at Lafayette, Ind. C. D. Emmons, general manager.

Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Ia.—This company has recently purchased a 1500-kw turbo-unit, which is now being installed.

Menominee & Marinette Light & Traction Company, Menominee, Mich.—This company has placed contracts during the past week with the Westinghouse Electric & Manufacturing Company for the following equipment: Two 1100-kw, 2200-volt, a. c. generators; two 100-kw, 125-volt, d. c. generators; four 750-kw, 2200-33,000-volt transformers; four 675-kw, 33,000-2200-volt transformers and switchboard for the above apparatus. Contracts were also placed with the Dayton Globe Iron Works Company for two 1900-hp water turbines; two 225-hp water turbines and four Lombard governors.

Chillicothe Electric Railroad, Light & Power Company, Chillicothe, Ohio.—This company has recently installed in its power station a new 300-kw, 500-volt, direct-current Westinghouse generator and a Moffett feed-water heater.

SHOPS AND BUILDINGS

Louisville & Southern Indiana Traction Company, New Albany, Ind.—This company, through the architectural firm of D. X. Murphy & Brother, has let contracts for the construction of an extension to its present terminal facilities on Third Street, between Green and Walnut Streets, Lexington, Ky. The contracts call for a one-story structure, which will furnish trackage accommodations double the present capacity. The building is to be constructed in such a manner that in future additional floors can be added above. The work will cost about \$8,000.

New Orleans Railway & Light Company, New Orleans, La.—This company has recently awarded a contract to Muir & Fromherty, New Orleans, for the construction of a steel annex to its repair shops.

Interstate Traction Company, Duluth, Minn.—This company has begun work on its new car house and repair shops. [E. R. J., Aug. 15, '08.]

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—John I. Beggs, president of this company, is reported to have announced that active work would be started during the winter upon the new car house at Ford du Lac Avenue, Thirty-fifth and Locust Streets. The building will be of stone, brick, concrete and steel. It will accommodate more than 200 cars at a time.

Manufactures & Supplies

ROLLING STOCK

Philadelphia (Pa.) Rapid Transit Company is in the market for 10 cars for elevated service.

Detroit (Mich.) United Railway is reported to be in the market for 25 city cars.

Baltimore & Ohio Railroad is asking for bids on three electric locomotives for service at the Baltimore terminal.

Green Bay (Wis.) Traction Company will soon receive two city cars from the American Car Company, St. Louis, Mo.

Twin City Rapid Transit Company, Minneapolis, Minn., is building at its Snelling Avenue shops 100 new cars with trucks.

Indianapolis Traction & Terminal Company, Indianapolis, Ind., is in the market for 50 new cars which will be ordered early next year.

Oregon Electric Railway, Portland, Ore., expects soon to receive six cars from the Niles Car & Manufacturing Company, Niles, Ohio.

Sioux City (Iowa) Traction Company has ordered 30 GE-81 railway motors, which will be used to replace old motors on cars already in service.

East St. Louis & Suburban Railway, East St. Louis, Ill., is having 15 cars built at the shops of the American Car Company, St. Louis, Mo.

Chicago & Milwaukee Electric Railroad, Chicago, Ill., will soon receive nine interurban cars from the Jewett Car Company, Newark, Ohio.

Southern Pacific Railroad is preparing specifications for 80 large-sized electric cars, to be put into service in Oakland, Cal., and its suburbs.

Wichita Railroad & Light Company, Wichita, Kan., is in the market to purchase six large double-truck open trailer cars for Summer service.

Dominion Power & Transmission Company, Ltd., Hamilton, Ont., is having two city cars built by the Kuhlman Car Company, Cleveland, Ohio.

Great Falls (Mont.) Street Railway has just ordered from the American Car Company, St. Louis, Mo., two new cars with complete equipment.

Eastern Pennsylvania Railways, Pottsville, Pa., has been overhauling its entire rolling stock and will equip all of its cars with fenders. A number of old cars are being rebuilt.

Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md., is ready to order three double truck cars similar to the high power cars now in service on that line.

Inter-Urban Railway, Des Moines, Ia., has purchased 10 36-ft., flat-bottom gondola cars from the Hicks Locomotive & Car Works. The cars, which will be delivered at once, are of 50,000-lb. capacity.

Erie Railroad is drawing up specifications for three or four cars to be added to the Rochester division. It is understood that they will be built on practically the same lines as those already in use.

Columbus Railway & Light Company, Columbus, Ohio, has received, and will place in service, six of the 10 new pay-as-you-enter cars which The J. G. Brill Company has been building for it. The other four cars will be ready before Jan. 1, 1909.

Twin Falls, North Side Land & Water Company, Boise, Idaho, has ordered from the Hicks Locomotive & Car Works one large locomotive to be used in construction work on the Idaho & Nevada Southern Electric Railway.

Detroit, Flint & Saginaw Railway, Detroit, Mich., has placed an order for two interurban cars with the Niles Car & Manufacturing Company. Baldwin trucks and Standard steel wheels were specified in the order. It is expected an order for four more cars will be placed by the company at an early date.

Michigan United Railways, Lansing, Mich., is soon to purchase electric and air brake apparatus for equipping three interurban cars for use on the new Jackson-Lansing division of the line, which will be opened for traffic next June. The company has already secured 12 passenger cars which will be used on this branch.

Chicago, Wheaton & Western Railway, Wheaton, Ill., has placed an order for three cars with The J. G. Brill Company. It is understood this order was placed with the privilege of increasing the order to six cars if desired. The cars will be similar in construction to the standard passenger cars used on the Aurora, Elgin & Chicago Railroad.

Cleveland (Ohio) Railway announces, through Warren Bicknell and Frank A. Scott, receivers, that the company is planning to equip its cars with fare boxes. The company has just received from the Kuhlman Car Company 21 cars which have been converted from the old style to pay-as-you-enter type, similar to those now in use on the line. One of the same type and three that are three feet longer are being built in the Cincinnati Car Company's shops.

Edmonton (Alberta, Can.) Radial Railway System is having built by the Ottawa (Ont.) Car Company seven motor cars, six double truck and one single truck, all of the semi-convertible type. The double truck cars are 38 ft. 6 in. long over all and will seat 40 passengers. The single truck car is 31 ft. long and will seat 32 passengers. The bottom framing of these cars is of wood reinforced with heavy steel plates and angles. The vestibules are circular in shape, and fitted at each side with automatic folding doors. The interior finish of the cars is cherry throughout, finished in natural color and polished. The seats are Ottawa Car Company's standard reversible, spring upholstered and covered with rattan. The larger of the car bodies are mounted on Brill 27-G-1 trucks, and the smaller on a Brill 21-E truck. The motor equipments are General Electric, No. 80, with K-6 and K-10 controllers. All of these cars are equipped with fenders and Piper electric headlights.

TRADE NOTES

Fort Pitt Spring & Manufacturing Company, Pittsburg, Pa., maker of coil and elliptic springs, is sending out to its friends a very nice little copper desk ash tray.

Pantasote Company, New York, reports that Agosote headlinings will be used in the construction of the 54 cars recently ordered by the Capital Traction Company from the Cincinnati Car Company.

Charles E. Dustin, formerly president of Charles E. Dustin & Company, has recently become associated with Rosister, MacGovern & Company, New York. Mr. Dustin is to act in an advisory capacity, giving to the business the benefit of his long and wide experience in the second-hand machinery field.

Wagner Electric Manufacturing Company, St. Louis.—The Wabash Railroad Company has just awarded to this company a contract for supplying the Fort Wayne (Ind.) locomotive repair shops throughout with Wagner poly-phase motors. Motors of from 10 to 40-hp capacity constitute this order and they will be used for driving all kinds of machine tools.

Minneapolis Steel & Machinery Company, Minneapolis, Minn., has secured the contract to install a new power plant for the Manhattan City & Interurban Railway Company, Manhattan, Kan. The installation will include an 18 in. x 36 in. heavy duty Twin City Corliss engine, two 66 in. x 18 ft. horizontal return tubular boilers, one 200 kw. direct current generator, switchboard, feed water heater and purifier, boiler feed pump, etc.

National Brake & Electric Company has secured the contract for equipping the 50 new motor cars and 10 trailers recently ordered by the Seattle Electric Company from the Cincinnati Car Company. These cars will be fitted with the latest type of semi-automatic air brake. The National Brake & Electric Company has also received an additional order from the Rio de Janeiro Tramways for 75 semi-automatic air-brake equipments.

Cooper Heater Company, Dayton, Ohio, reports that it has recently sold heaters for equipping five cars for the United Traction Company, Reading, Pa., and seven cars for the Joliet & Southern Traction Company, Joliet, Ill. The latter company has been carrying on experiments in car heating for the past 30 days with the Cooper hot-water car heater, and announces that the system has proved satisfactory, and that within a month every car on the line would be equipped with these heaters.

Wagner Electric Manufacturing Company, St. Louis, announces the appointment of Frank N. Jewett as general sales manager, with headquarters at the main office and factory in St. Louis. Mr. Jewett has been district manager of the Wagner company at Chicago for the past three years. He has a large acquaintance among the electrical fraternity, not only on account of his position with the Wagner company at Chicago, but also through having been for 10 years Western representative of Evans-Almirall & Company, of New York, in the sale and installation of central-station heating plants.

Bridgeport Brass Company, Bridgeport, Conn., through the Department of Bridges of New York City has received orders for 31,000 ft. of No. 0000 phono-electric trolley wire for the new Blackwell's Island bridge between New York

and Long Island City. Phono-electric wire is also used on the tracks over the Brooklyn and Williamsburg bridges, which are also under the jurisdiction of the Department of Bridges. In fact, it was owing to the excellent results obtained at these two installations that led the department to select phono-electric for the latest span between Manhattan Island and Long Island.

Westinghouse Electric & Manufacturing Company, Pittsburg, Pa., has begun the shipment of railway motors to the Metropolitan Street Railway, New York, for the equipment of its new pay-as-you-enter cars. The contract for cars was divided by the Metropolitan Street Railway between two companies, but that for the 125 complete electrical and air-brake equipments required on the cars was awarded to the Westinghouse Electric & Manufacturing Company about two months ago. The motors are of the commutating pole, box type, and are from 55 hp to 65 hp, or somewhat larger in capacity than those now in operation. They were designed especially to meet the service requirements of the Metropolitan Street Railway, which are unusually severe for motors of this size, owing to the use of maximum traction trucks and narrow, low cars.

ADVERTISING LITERATURE

Railroad Supply Company, Chicago, Ill.—The new catalog of this company devotes especial attention to describing the R.R.S. derailer. The operation is well illustrated with half-tones and line drawings, and is fully detailed. This same company has recently issued a catalog devoted to the Wolhaupter shoulder flange tie plates. Several pages are devoted to reports on the results of tests of these and other joints.

Pratt & Whitney Company, Hartford, Conn.—The new catalog of this company is one of the most attractive it has ever issued, and describes, with illustrations, many of the leading milling machines which the concern manufactures, giving full specifications and details as to operation. The products of this company are denoted "precision tools" and especially adapted for the high-grade milling that is required in the production of accurate work.

Stone & Webster Engineering Corporation, Boston, Mass.—This company is sending out a leaflet descriptive of its work on the three main power stations of the Boston Elevated Railway, which operates all the elevated and surface lines in Boston. The company, by concentrated effort, was able to design and erect building extensions for 36,000 hp. and to purchase and install 20,000 hp. of new machinery, all within 10 months, without interrupting the operation of the heavily loaded plants.

The J. G. Brill Company, Philadelphia, Pa.—The November issue of "Brill's Magazine" is handsomely illustrated and contains many features of interest to equipment engineers. An especially interesting article deals with "Street Sprinkling as a Source of Revenue for Electric Railways," and gives instances where conspicuous success has been made in this branch of work. The new convertible cars for the Hanover & McSherrystown Street Railway are described and illustrated. The advantages of substantial car construction are also set forth in an interesting illustrated article.

Brown Hoisting Machinery Company, Cleveland, O.—The new catalog which has just been issued by this company is typographically and in the matter of illustrations one of the most attractive it has ever put out. It is especially devoted to "Brownhoist" grab buckets and tubs, which are adapted for handling ore, coal, sand, gravel and other crushed substances. It is claimed that they depart from all old lines of grab buckets, and that they have achieved the maximum service results possible in this class of operation. They can easily be adapted to stationary or to traveling cranes and their construction admits of great flexibility.

Western Electric Company, New York.—This company is sending out a little booklet just published entitled "Pointers on Power." It takes up the subject of machine drive by induction motors quite comprehensively and shows illustrations of Western Electric Company's induction motors attached to various types of machine tools. "What the Western Electric Company Is Doing to Increase the Central Station Load" is the title of another of this company's publications. After a little review of the recent work of the company, many of the attractive advertisements which the Western Electric has been putting out are reproduced.

General Electric Company, Schenectady, N. Y.—Among the pamphlets recently issued by this company is one which contains matter descriptive of the company's curve drawing instruments for alternating and direct current circuits. These instruments, though they have been in commercial use for several years, have been recently improved.

The bulletin contains also connections, dimension diagrams and prices. The company has also just sent out a folder descriptive of its decorative lighting outfits in connection with Christmas greens. General Electric outfits are made in sizes containing from eight to 32 lamps and may be connected to any lamp socket.

ELECTRIC RAILWAY PATENTS

UNITED STATES PATENTS ISSUED NOVEMBER 17, 1908

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 41 Park Row, New York.]

Rail, 903,883; Uriah G. Potts, Martinsburg, W. Va. App. filed Sept. 18, 1907. The rail tread has a depending tongue adapted to be secured in a slotted base embedded in concrete. The tread can therefore be removed when worn and replaced.

Fluid Pressure System, 903,892; William F. Schneider, Norwood, Ohio. App. filed April 29, 1907. Air brake for trolley cars. Electric motor drives air compressor. Motor circuit controlled by two magnets, one energized when pressure in one air reservoir reaches a maximum, the other when pressure in other air reservoir reaches a minimum.

Safety Hanger for Brake Beams, 903,954; Turney E. Buck, Springfield, Ill. App. filed Feb. 5, 1908. Provides a safety hanger so designed that it will not interfere with the movement of the brake beam towards or away from the wheel, and in case of breakage of the primary brake hanger will support the brake beam so that it will not fall onto the track.

Movable Point Crossing, 903,974; William M. Henderson, High Spire, Pa. App. filed June 26, 1906. The inner portion of the head of the continuous track rail is cut away and the rail is bent slightly outwardly. Secured to the inner side of the rail is a hard-metal piece whose inner edges are in line with the gage lines of the continuous track-rail head. The apex or "knuckle" is formed by the meeting of the said edges of the wear-piece at a point adjacent the points of the movable point rails.

Switch Operating Mechanism, 904,042; Robert Brown, Westminster, London, Eng. App. filed July 25, 1906. Electric switches in a closed conduit throw in contacts above street surface, the switches being actuated by a member on the car. Details in construction of actuating device.

Railroad Tie, 904,061; Joseph Grimmer, Griffith, Ind. App. filed Dec. 30, 1907. Relates to means for securing the rail clamping plates to a metallic tie, whereby the rails will be securely locked in alignment without danger of spreading.

Insulator, 904,069; Willard H. Kempton, Trimble, Ohio. App. filed Dec. 16, 1907. An insulator for the guy wires of electric railways made of sections connected by cylindrical shell with detailed construction of shell and section.

Railway Block-Signaling System, 904,116; Harry M. Coulter, Chicago, Ill. App. filed April 8, 1907. Details of construction. Relates to improvements on patentee's prior patent, 794,784.

Car Wheel, 904,162; Frederick K. Vial, La Grange, Ill. App. filed Aug. 11, 1908. Comprises a strengthening rib extending around the outer ends of the spokes, a web connecting the strengthening rib and the tread, said web being formed with a plurality of thickened portions or ribs extending between the strengthening rib and the tread.

Rail Joint, 904,205; Albert J. Holmquist, Rockford, Ill. App. filed May 18, 1908. Details of construction.

Railroad Tie, 904,331; Whelock Hubbell and Asa J. Annis, Siloam Springs, Ark. App. filed May 21, 1908. The tie consists of a transverse channel member having a rail chair secured thereto, there being a recess in the rail chair and a wedge cushion disposed therein.

Trolley Harp, 904,359; Joseph Pensis, Speers, Pa. App. filed Jan. 31, 1908. The wire lies between the wheel and a pivoted car which yields in passing hangers, etc., whereby the wheel is prevented from leaving the wire.

Attachment for Trolley Poles, 904,363; Constantin Buggaber, Buffalo, N. Y. App. filed May 28, 1908. Prevents breaking contact if wheel leaves the wire, in which case the harp will make the connection.

Automatic Car Fender, 904,471; John A. Byers, Vancouver, British Columbia, Can. App. filed April 27, 1908. Relates to that type of fender having an actuating bar in advance thereof and a supplementary fender which is dropped to operative position simultaneously with the dropping of the main fender.

Trolley Head and Harp, 904,491; Charles E. Marks, Virginia Beach, Va. App. filed Sept. 6, 1907. In order to prevent the wheel from leaving the wire, idler wheels are attached to the harp and extend above the wire.