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## The Latest Stage of the Cleveland Controversy

With the passage of the ordinance embodying the decisions of Judge Tayler as arbitrator, preparatory to submission to the voters of the city, the Cleveland controversy reaches another stage. Until the referendum is taken the actual settlement of the negotiations between the city and the company remains in abeyance. The proceedings conducted in the presence of Judge Tayler have presaged some such terms of settlement as those that were actually announced so that the final details contain no surprising developments. In brief, the arrangement is based on a recent arbitrary valuation of the property, which did not differ materially in amount from that reported by Messrs. Goff and Johnson, and it allows a fixed dividend return of 6 per cent on the stock and prescribes a maximum and a minimum rate of fare. As it stands before the public for final acceptance or rejection, the plan appears to be based on a determined effort to achieve a low rate of fare, to make the valuation such as will tend to that end and to inject an apparent spirit of fairness into the experiment by permitting a return of 6 per cent on the stock. If the ordinance is accepted by the people of Cleveland there will be a peculiar demonstration of an arbitrary low rate of fare, a predetermined rate of dividend, and a service that must meet the requirements of the fare and dividend conditions prescribed by franchise.

## Higher Trolley Voltage

When the poor load factor of the average railway is taken into consideration, power in the great majority of cases is being generated at very fair economy. In some stations there is, of course, great opportunity for improvement, but in many others little reduction in generating cost is to be expected unless some radical change takes place in the art of power generation. This same statement, however, cannot be made in regard to the current after it leaves the power station switchboard. It is here, in a large proportion of the cases, that there is great opportunity for effective savings.

It would be a revelation in many cases to measure and value the kw-hours delivered to the cars, and then to compare these figures with those obtained at the generator. To the power station cost must be added not only the losses in transmission from the power station to the substations, but the cost of substation conversion and of low-tension d.c. distribution. This in many cases more than doubles the cost at the switchboard. For instance, in a railway system operating 300 miles of interurban track and serving a territory within a radius of 75 miles from the power station, the cost at the latter point is 4 mills, while at the d.c. feeder panels in the substation the cost is more than 9 mills. It is not difficult to see how this increase in cost occurs. The load factor of an interurban railway substation is nearly always poor, so that with substations of 300 kw capacity there may be a labor charge

of \$80 a month to be set against an average output of less than 100 kw.

The solution of this problem for the interurban road is not necessarily single-phase operation, but fewer substations to be made possible by using a higher trolley voltage. Single-phase railways have proved definitely that an overhead construction can be built to handle economically and practically a high trolley potential. Whether the single-phase system or direct current should be adopted in any particular case depends upon a careful study of all the circumstances, including the distribution conditions at the terminals. Even a doubling of the trolley voltage would greatly reduce the number of substations on the average road, and would correspondingly increase the capacity of the substations and improve their load factors.

### Oxidized Aluminum for Motor Fields

The use of aluminum wire for transmission purposes is no longer a novelty, but until very lately no advantage had been taken of the great affinity which this conductor has for combining with oxygen to form an insulating film. In the United States the only practical application apparently has been confined to the construction of magnets and induction coils. During the past two years, however, several German railway companies have been testing the availability of oxidized aluminum as a substitute for fiber-insulated copper in making field coils. According to the report of Mr. Paulsmeier to the German Street & Interurban Railway Association as published in this number, the experiments along this line have been successful enough to make the permanent use of oxidized aluminum more than a possibility. In fact, the Hamburg company alone is now using over 150 coils in regular service.

This striking departure in railway motor construction brings up several interesting points. While the impulse to undertake these trials two or three years ago was given by the then high price of copper and the comparative cheapness of aluminum, experience with the new wire has shown that it has other advantages than those of price. Thus the overload ability of a motor with the new coils is limited only by the commutator because there is no cotton insulation to be charred from overheating. A motor with oxidized bare aluminum and with insulating layers between the coils constituting a field, as described by Mr. Paulsmeier, should therefore have no difficulty in operating above the 75 deg. C. hour rating fixed by the A. I. E. E. rules for railway motors with cotton or similar insulation. Short-circuits appear to have been greatly reduced in the new motors for the very reason that they had no wire insulation which could become carbonized by heating. As a railway motor is a piece of apparatus most limited in its dimensions, it was essential also that the aluminum coils should not take up more space than copper coils having the same magnetic flux and internal resistance. The experiments made by the different railway companies showed that this object could be accomplished despite the larger mass of aluminum required, because no other covering than the oxide film was required between adjoining turns of a coil. The most remarkable feature of the aluminum wire construction, however, is the great saving in weight. In the case of the 27-hp to 40-hp motors commonly used in German city railway service the saving amounts to 80 lb. to 100 lb. per motor, as the new coils weigh only one-half as much as the old ones. In this country, where much larger

motors are common, the proportionate reduction in weight per motor would be 110 lb. and 172 lb., respectively, for the GE-80 and GE-64 types, and 124 lb. and 150 lb., respectively, for the Westinghouse 93 and 81 types. In any event it is certain that the aluminum field coil deserves serious consideration aside from the question of price, because it promises important improvements in maintenance and weight without involving serious changes in the other parts of the motor.

### The Functions of the Purchasing Agent

One of the difficult problems in the organization of a large electric railway is to define the powers which should be exerted by the purchasing agent and engineer respectively in buying supplies. The former, staggered perhaps by the sum total of the requisitions received by him from every department, is inclined to buy in the cheapest market and to keep the stock on hand to a minimum; the latter may be unduly impressed by the commanding importance of his own department and feel that he should have his requisitions filled promptly and on the basis of quality alone.

Most purchasing agents have neither the time nor the training to decide on their own responsibility whether the higher price of an article is justified by its superior quality. The items which they can buy intelligently without instructions from the engineer include mainly such staples as wires and cables, but in these articles the prices of each grade are quite definitely fixed so that the choice resolves itself as to which of half a dozen reliable firms can make the best delivery. In other cases, the purchasing agent, through his superior knowledge of market conditions, can buy specified material from jobbers who sell at less than manufacturers' prices. On the whole, however, the great majority of the apparatus used by a railway cannot be bought on the basis of first cost alone without tempting bidders to a deterioration in quality proportionate to the cutting down of their prices. The engineer who orders a certain grade of line material because he has found it more reliable than any other is justified in rejecting inferior goods even if the patterns are the same, because he is the man who is held responsible for the maintenance of the line. Experience has taught him that the first cost of the equipment is a minor consideration when compared with the expense of repairing break-downs. It is unjust for the engineer, however, to expect that when large quantities of a given article are ordered for the first time the purchasing agent should put the requisition through without calling for competition. In such cases the latter should be furnished with specifications so rigidly drawn that the bidders will have to compete on the basis of both quality and price. Furthermore, if the railway company itself is not equipped to carry out tests on samples of the material submitted, arrangements should be made with some testing laboratory for that purpose. When the same items are called for on re-orders either for stock or emergency purposes, the requisition should be transmitted at once to the successful manufacturer without going again through the expensive and time-consuming process of calling for bids from everybody in the business. The street railway company's buyer should not be like the overzealous purchasing agent of a certain manufacturing company who asks for prices from every foundry in the city whenever a half dozen 6-in. wheels are wanted for the coal conveyor or who circularizes all the hardware dealers when a new wheelbarrow is needed for handling ashes in the boiler room.

Another point about which particular care should be exercised is in buying unfinished parts. Where the finished part varies from the maker's standard, it may be worth while to do the finishing in the railway company's shops, but as a general rule it is not profitable. One purchasing agent, for example, insists on buying square-end bars for the track department and then has them pointed in his shops, although he had been advised several times that the expense of doing this at home is about three times the difference in the manufacturer's price between the square and the pointed bars. It is easy to lose a good deal of money through such wrong-ended economy and it would be well always to get an estimate from the shop superintendent for finishing the journal box or other parts which can be bought in the rough at a lower first cost.

In conclusion, it may be pointed out that the duty of the purchasing agent does not end with the placing of the requisition. It is also his business to follow up the requisition to see that the articles are shipped on the dates promised and delivered to the proper department as soon as they arrive. There is no reason why the department which needs the material should be kept in ignorance of the progress made on its requisitions.

### Arbitration Boards in London

Much interest has been aroused abroad in the new plan of the London County Council Tramways for dealing with disputes with employees over questions relating to wages, hours of labor and general conditions of labor, including matters of discipline or management. Reference was made in these columns recently to the employees' committee of the Hudson & Manhattan Railroad which acts as a medium of intercourse between the men and the officers over them, through which suggestions for improvement of the service as well as complaints are presented for consideration. The London plan of so-called conciliation boards is based on somewhat similar principles. It has been approved by the Board of Trade and ratified by an almost unanimous vote of the employees.

Four sectional conciliation boards and one central board have been created. The sectional boards are made up of an even number of employees and representatives of the County Council elected for a term of three years. The central board is made up of an even number of representatives from each party on each of the sectional boards. Sectional board No. 1 is composed of representatives of the motormen and conductors, together with the chief officer of tramways, who sits on each of the sectional boards, and the tramways traffic manager. Sectional board No. 2 is drawn from the shop men and depot inspectors and repairmen, and the rolling stock superintendent represents the Council on it. The power house, substation and line employees are represented on board No. 3, which also includes the tramways electrical engineer. The fourth sectional board is made up of representatives from the track and roadway department and includes also the engineer of permanent way.

Each sectional board considers only questions affecting employees in the departments represented thereon. Before a sectional board can consider any proposal from the employees for a change in wages, hours of labor or other conditions an application for such change must be made to the chief officer of tramways and by him referred to the proper sectional board if he is not willing to grant the request voluntarily. When the Council proposes to make any change involving a reduction in wages or increase in hours a notice is to be posted for a rea-

sonable time where it can be seen by all employees affected. If there is any objection to the change the employees may request that the matter be referred to the proper sectional board.

The sectional boards are to meet not oftener than every two months. Their decisions are subject to appeal to the central board either by the Council or by the employees, or if any board is unable to agree, the question under consideration must be referred to the central board for a decision. Any decision by a sectional board from which there is no appeal to the central board is binding and no decision which has been accepted can be reopened within a year. This will prevent any unnecessary repetition in the work of the board, which otherwise might be kept busy considering the same complaints over and over again.

The decisions of the central board likewise are open to an appeal to a single arbitrator either by the Council or the employees, or if the central board fails to agree an arbitrator may be appointed by mutual consent of both sides. If an arbitrator cannot be selected by mutual agreement of the central board, the Board of Trade, representing the British Government, is authorized to make the appointment. The arbitrator's decision is final and binding on both sides and the expense of the arbitration proceedings is to be borne by the Council and the employees in such proportion as the arbitrator may determine.

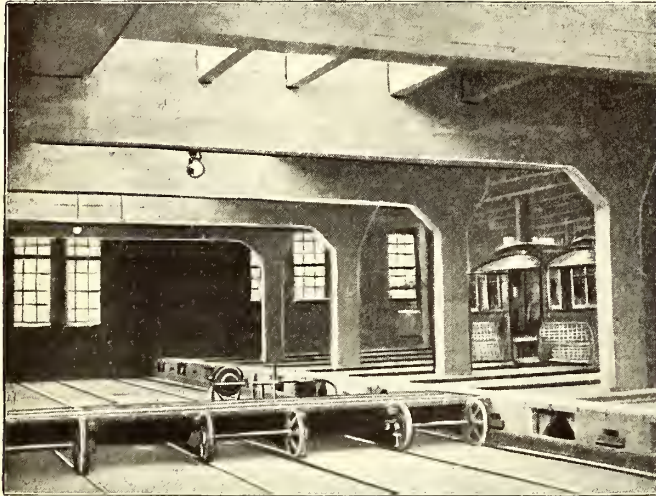
The plan bears a close resemblance to the modern judiciary system of trial and appellate courts, including even the apportionment of the costs of bring the causes to trial. Just as the lower branches of the courts of law are divided into criminal, civil and probate divisions so the sectional boards are composed of representatives from the different departments, each familiar with the special conditions which prevail. Motormen and conductors do not pass upon the merits of questions affecting men in the track department or vice versa. The court of last appeal is the authorized representative of the Board of Trade, or, in other words, the British Government, and in England the respect for authority is profound. Of course the plan is designed especially for a municipal railway and its success depends on the integrity of both the employees and the Council in living up in good faith to the spirit of the agreement and submitting gracefully to adverse decisions when given. No power except that of public opinion can compel obedience to the provisions of such a voluntary arbitration agreement.

The plan is particularly interesting for two reasons. One is the appeal provided to the general government, as represented by the Board of Trade. This is perhaps a logical result of the municipal control of public and semi-public utilities, now so general in Great Britain, and in this respect conditions differ from those in this country where the ideas of individual activity and responsibility are predominant.

The other principal point in the proposed arrangement is that the provisions of the agreement expressly exclude from consideration in the manner described questions of discipline and management. But to prevent the very disagreements which brought the plan into existence, we believe this line must be sharply drawn and closely guarded against trespass. Matters of discipline and conditions of labor are often very closely allied, but all will agree that the management of a street railway, which is entrusted with the responsibility of its operation, must be the sole judge of the acts of the employees. Discipline implies supreme authority and power to punish for cause. If this power is weakened by the possibility of reversal of judgment by some outside arbitrator, discipline would soon cease to exist.

## NEW CAR HOUSE OF THE CAPITAL TRACTION COMPANY, WASHINGTON, D. C.

The Capital Traction Company, Washington, D. C., now has in use a new car house built last summer at Eighth and M Streets S. E., opposite the entrance to the Navy Yard. Three lines, including the Navy Yard-Georgetown line, terminate at this car house, and facilities have been provided for making light repairs and inspections, as well as trainmen's quarters, receivers' cages and superintendent's office. The building is unique in that it is designed to ultimately have two floors over



Washington Car House—Transfer Table in New Section

the entire area, the second floor to be used for storing cars out of service. It occupies an entire block, and is 251 ft. x 289 ft. 10 in. in dimensions. Reinforced concrete construction on the Johnson system has been used throughout for the pit walls, columns, roof girders and slabs. The walls are of red clay brick outside and white sand lime brick inside. A wooden-frame, brick-walled car house, 97 ft. wide and containing nine storage tracks formerly occupied part of the block, and the walls of this old structure have been retained in the enlarged building, as they were high enough originally to accommodate two floors. The concrete pits, second floor and roof, however, are new, and were designed to be uniform with those in the new section of the house adjoining.

The house is of the transfer table entrance type, which is well adapted to underground conduit operation because of the saving over the cost of complicated slotted special work. The streets surrounding the car house on three sides are narrow and a track entrance would have required the sacrifice of as much or more storage space within the building lines as the single transfer table pit. A loop running track around the entire block allows unrestricted movement of through cars, which turn at this point, and on three sides of the building a second loop track has been built inside of the running track. The two entrance tracks at each end of the building turn out from this inside loop track. The inside loop track serves to hold cars awaiting their turn to be run into the car house, and also removes all entrance track switches from the outside loop or running track.

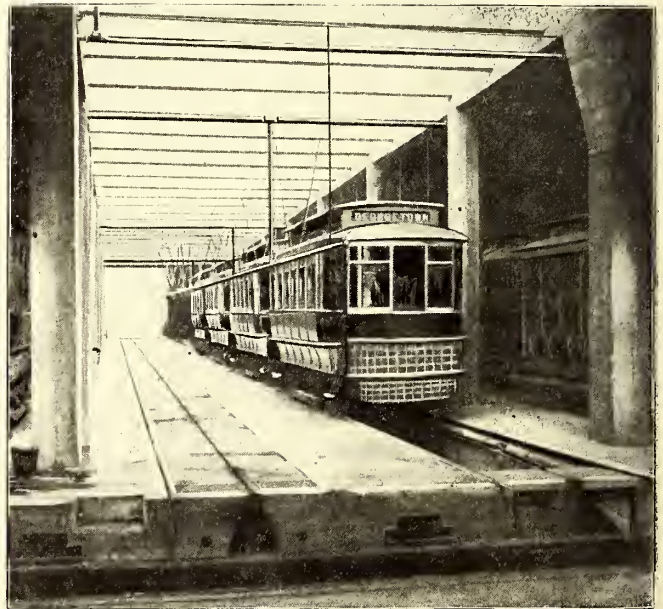
Two conduit entrance tracks run through the house just west of the partition wall. All the other tracks on the ground floor of both sections of the house have open pits below them with the exception of the tracks next to the partition wall on each side and the two tracks next to the old east wall, which have concrete flush floors, and are used for storage of trailer cars. Between the transfer table pit and the north wall of the house all the tracks are on a 2 per cent grade, descending toward the transfer table. Cars are run in on the transfer table, which is spotted opposite the desired track, and are then started from the table under their own power for a run up the 2 per cent

grade. It is seldom necessary to attach the pit leads to the plows in order to run the cars even to the extreme end of the house. The light trailers are pushed off the table by hand. In getting cars out of the house they are allowed to drop down to the transfer table by gravity. Along the south wall of the house are two short pit repair tracks in the old house and nine pit tracks and two surface tracks in the new section. These short tracks are all on level grade. The total storage space in both sections is sufficient to accommodate 142 of the company's new standard double-truck cars, 43 ft. long over all. The first floor of the old section will hold 34 cars, and the second floor 40 cars. The first floor of the new section will hold 68 cars, and when the second floor is added at some future time 70 cars can be stored there. A larger number of the old single-truck motor and trail cars, of course, can be stored in the building, as long as they are kept in service.

The second floor of the old section contains eight long surface storage tracks and seven short tracks, all on a level grade. It is served with a transfer table running in a pit, which will ultimately be extended across the present roof of the new section when a second floor is added. The transfer table is reached by an incline track along the east wall, entering the building from the street at the north end, and rising on a 6.4 per cent grade. The entrance track conduit is continued for a distance of 32 ft. into the building, and terminates in a plow pit, beyond which the incline track has a flush reinforced concrete floor between and outside of the rails. Motor cars will be run up the grade under their own power by making jumper connections, the same as when on the pit tracks. The incline is supported by reinforced concrete columns on the inside and by the outside wall, into which the ends of the cross-girders are gained.

### REPAIR BAY

The repair bay, for making running repairs, is located in the south end of the old section adjoining the superintendent's



Washington Car House—One Bay in New Section, Showing Aisle Sprinklers

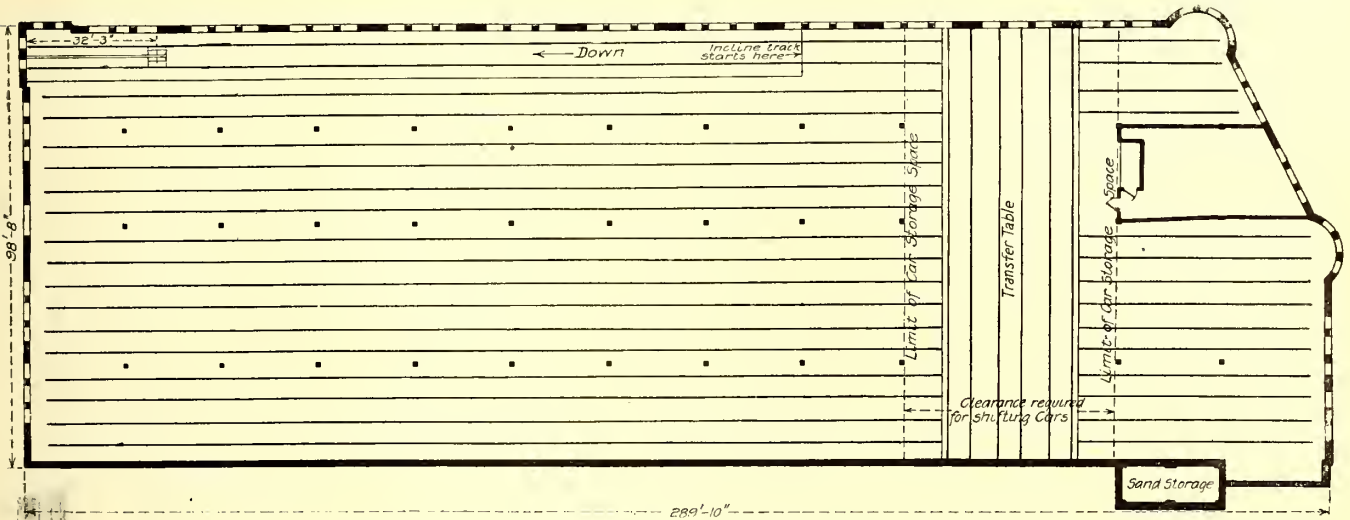
office and trainmen's quarters. It contains two tracks 40 ft. long and spaced 12 ft. center to center, which are supported in an open pit 5 ft. deep on reinforced concrete pillars 10 in. x 12 in. at the top. The shop floor is level with the top of the rails. Adjoining the shop, but separated from it by fire walls, is an oil room 13 ft. 6 in. x 21 ft. 6 in. Above the oil room, on a mezzanine floor, is a sand-drying and dry-sand storage room. On the second floor, immediately above the dry-sand storage room, is a wet-sand storage space, and on the roof above this is a 35,000-gal. water tank connected to the sprinkler system. The dry sand is drawn by gravity through a spout leading down to

the ground floor alongside the easterly entrance track. The sand boxes on outgoing cars can be filled from this spout with the minimum of labor.

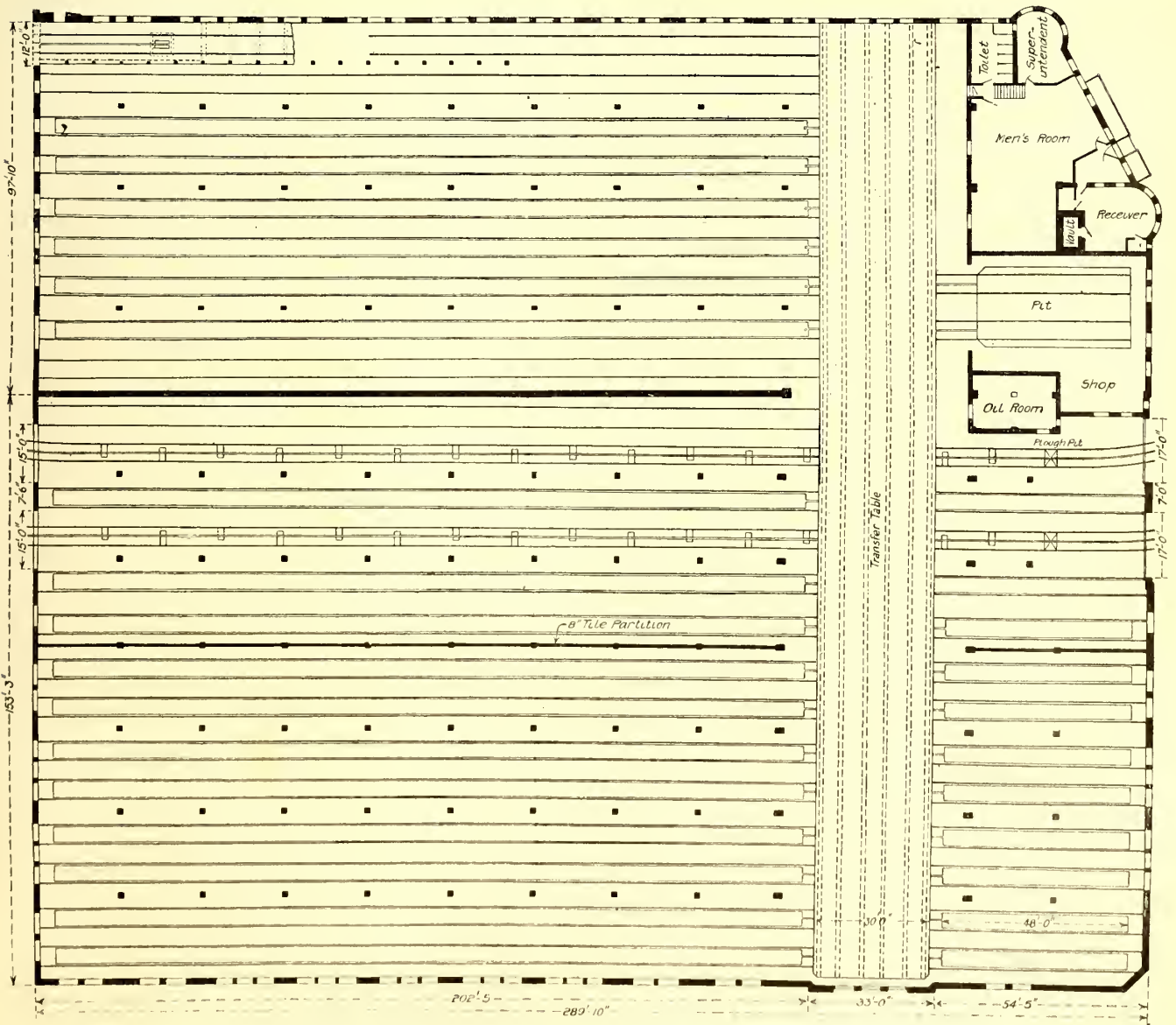
OFFICES AND TRAINMEN'S QUARTERS

The offices are located on the ground floor in the southeast corner of the old section. The entrance is through a vestibule,

opening off of which is the receiver's office. Beyond the vestibule is a large men's room. The superintendent's office is in the corner of the building and has a projecting bow window, from which a view north on Eighth Street can be had. A well-appointed toilet room adjoins the superintendent's office. From the men's room a stairway leads up to the second floor, and



Washington Car House—Plan of Second Floor of Old Section



Washington Car House—First Floor Plan of Old and New Sections



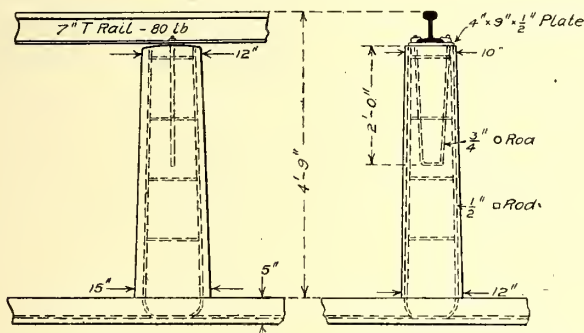
is added the cinder concrete banking can be scraped off of the slabs, leaving a level floor.

SPRINKLERS

The car house has been completely equipped with automatic aisle sprinklers in the longitudinal bays and curtain sprinklers along the transfer table pits. The aisle sprinkler heads are attached at intervals of 7 ft. to pipe lines suspended from the ceiling girders at about the height of the tops of the car windows. One line of sprinklers extends down the center of each bay, but no heads are installed in the aisles between tracks from which the concrete roof columns rise. Three curtain sprinkler heads protect the end of each bay at the transfer table pit. The sprinkler system which was installed by the International Sprinkler Company, Philadelphia, Pa., is supplied with water from a 35,000-gal. tank on the roof over the oil and sand storage. As an additional precaution against the spread of a fire in the new section, an 8-in. hollow tile fire wall has been put in between the fourth and fifth bays.

LIGHTING

Liberal window space has been provided in all the outside walls of the building, and the temporary skylights in the roof of the new section provide additional daylight. The addition of a second floor at a later time, however, will cut off the daylight from the inside bays and require the use of lamps both day and night. Incandescent lamps of 16 cp are used for general illumination, but enclosed arc lamps are also hung from the ceiling over the transfer table pits. The lighting circuits are arranged on the three-wire system and throughout



Washington Car House—Details of Pit Columns in Shop Bay

the building are run in iron conduit. For lighting the aisles the conduit is tied underneath the sprinkler pipes and the lamps are mounted in conduit sockets spaced about 25 ft. apart. This arrangement is the same as that used in the Fourteenth Street car house of the company, where it has proved very satisfactory from the standpoint of both illumination and maintenance. The pit lamps are also mounted in conduit sockets and are set in recesses spaced 50 ft. apart and staggered on opposite walls of the pits.

The buildings were designed and erected under the supervision of J. H. Hanna, chief engineer, Capital Traction Company, to whom this paper is indebted for the drawings and information from which this description was prepared.

A CORRECTION

In the article entitled "The Sign of the Times," by Thomas N. McCarter, president, Public Service Corporation of New Jersey, published last week, a typographical error occurred on page 16. The author is quoted as saying: "But I do not have enduring faith in the ultimate common-sense of the American people," etc. Actually the sentence should have read: "Did I not have enduring faith in the ultimate common-sense of the American people, and in the resultant attitude of their law-making representatives, I would unhesitatingly recommend allowing one's money to remain in a savings bank, drawing 4 per cent interest, rather than in an investment of the character of which I have spoken."

OXIDIZED ALUMINUM WIRE FOR RAILWAY MOTOR FIELD COILS

An interesting paper was presented at the September, 1909, meeting of the Vereins Deutscher Strassenbahn-und-Kleinbahn-Verwaltungen (German Street & Interurban Railway Association) by Mr. Paulsmeier, a Hamburg engineer, on experiments recently made in Germany with oxidized aluminum wire for railway motor field coils. The author pointed out that hitherto the electrical uses of aluminum had been limited because its conductivity is only 59 per cent that of copper. Hence the aluminum wire must have 1.7 times the cross-section of copper wire for the same resistance and length. This would make it impracticable to use aluminum in apparatus where space is a factor if it were essential to employ some form of fiber insulation as with copper coils. It has been found possible, however, to take advantage of the property of aluminum to take an oxide film known as alumina. The resistance of this oxide film is sufficient to prevent short circuits between parallel adjoining wires in the same winding, where the differences of potential do not exceed 0.5 volt. Some other form of insulation is required, however, between successive windings owing to their greater difference of potential. When oxidized coils are made in this way they can be used to replace fiber-insulated copper coils of like strength within the old dimensions. It is also possible to save space and secure a better distribution of mechanical strains by using square wire instead of the round copper wires customary in small railway motors. A successful aluminum-wound motor means lighter weight, lower first cost and absence of short-circuits as caused by the charring of cotton insulation. The decrease in maintenance cost applies particularly in the case of railway motors because their insulation is most likely to be disintegrated by shock.

At the time of Mr. Paulsmeier's report 11 railways were using aluminum field coils and others were preparing to experiment with them. Some of the pioneers used round wire and others employed square wire. Some had fiber insulation on the wires throughout while others used plain oxidized wires with layers of paper, asbestos, fiber or linen between successive coils. Several made no change in the internal resistance and the number of turns while others sought only to have the internal resistance as before. Eight companies stated that the aluminum coils developed no defects whatever. In one case a company installed on March 17, 1907, four bare-wire field coils of which two proved defective. Here one failure was due to a short-circuit between two coils separated by linen and the other to a similar occurrence between adjoining turns. The other two coils have never given any trouble. A second company reported that there were superficial short-circuits, but only when the fields were first placed in operation, and a third stated that there had been short-circuits between adjoining windings.

The Hamburg street railway system began to try aluminum field coils in June, 1908. The coils were furnished by two companies and were installed in their respective motors without preliminary tests. It was soon discovered that the motors fitted out by one company had greatly decreased in their tractive effort and hence the coils were removed. The other company's coils, however, did not cause any important change in the motor performances although their internal resistance exceeded that of the replaced copper. After 10 months' service an examination disclosed the fact that the second company had supplied fiber-insulated aluminum. The insulation was badly carbonized, but as there was no evidence of short-circuits, the coils were continued in service. Apparently both manufacturers had used fiber over the oxide film merely as a precaution.

In 1909 the Hamburg railway purchased a number of square wire coils for use in GE-800 motors. Two of them had short-circuits, but investigation showed that the trouble arose from the distortion and shifting of the coils in the formers. This was easily remedied and after successfully using 100 of such coils in 30 motors the Hamburg company ordered 52 coils more. To determine whether these oxidized wire windings undergo any changes in operation, each coil was given a number before

installation and carefully tested, especially as to resistance. When these tests were repeated several months later the coils showed no deterioration and in fact some of them had improved, presumably because they had not been thoroughly dried out at the time of installation.

The advantages asserted for the aluminum wire, whether bare or fibre insulated, are particularly those of lower first cost and reduced weight. As for the item of cost, the real difference between aluminum and copper is not considerable if due allowance be made for the high scrap value of the latter metal. With regard to weight, however, it has been found that even in the moderate-sized street railway motors used abroad it is possible to save 80 lb. to 100 lb. per motor, as the coils weigh only about

pressures corresponding to service conditions. The only objection to the present apparatus is its inability to test the coils unless they are first removed from the motor case. The company, however, is now perfecting a means of testing the coils in the case.

### FIGHTING SNOW IN BROOKLYN

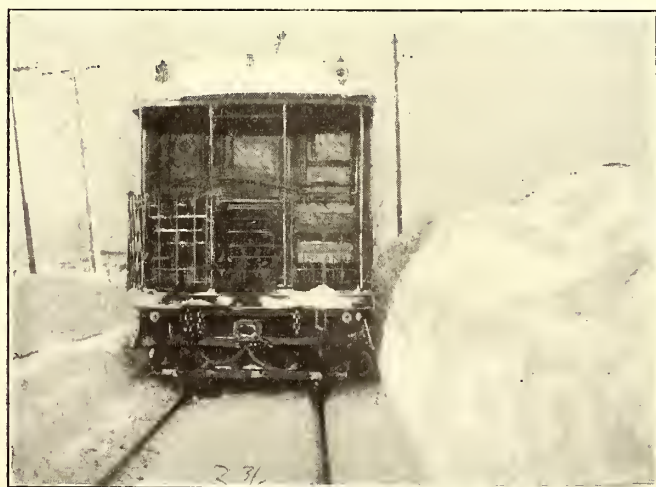
On Dec. 25 and 26 New York was visited by an unusually severe snowstorm. The first flakes appeared about noon on Dec. 25, but the snowfall did not begin in earnest until 5 p. m. According to the officials of the weather bureau, the total precipitation was 10.1 in., but unfortunately the snow was accom-



Bucking a Drift on the West End Route to Coney Island

one-half as much as those of copper. Mr. Paulsmeier believes that the troubles incidental to the introduction of any new method had been overcome. He states that even if the life of the aluminum coil did not exceed that of copper it would pay to use the former.

The presence of short-circuits in aluminum coils is indicated in service by decreased tractive effort, fuse blow-outs and poorer operation of the short-circuiting brakes. Most companies try out their coils through current, voltage and resistance measurements. The Hamburg company has devised a simple apparatus to test the comparative magnetic strength of



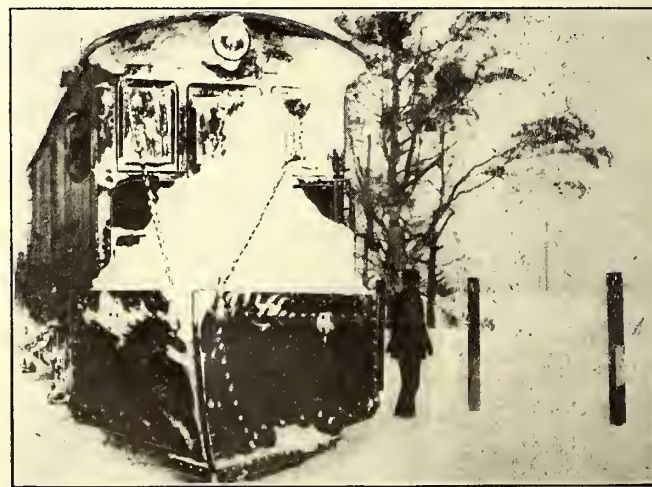
Following in the Wake of the Locomotive Plow

new and defective coils. The principal element is an iron core which is excited by the coil under test. The magnetized core attracts an armature attached to a spring scale. Thus the pointer on the scale will show the effect of connecting into the railway circuit a coil carrying a load of, say, 40 amp. It has been found unnecessary to test the field coils under mechanical



View Along West End Line After Opening for Service

panied by a gale from the northwest which reached a maximum of 58 m.p.h. at midnight on Dec. 25 and remained at about 45 m.p.h. on Dec. 26. One of the worst sufferers from the storm was the Brooklyn Rapid Transit Company, which has a considerable part of its mileage in the thinly settled territory between Brooklyn and the beaches. The unexpectedness of the storm and the fact that it occurred on Christmas day when many men were on holiday leave made it exceptionally difficult to keep the lines open even in the settled portions of the city. As soon as the storm gave the first indications of severity, the transportation department sent out hurry calls for the plow and



Electric Freight Locomotive Fitted for Snow Fighting

sweeper crews and the mechanical department bent every effort to get hold of the men assigned to care for the snow-fighting machinery. There were available from a total of 17 surface distributing depots 40 sweepers and 26 plows. The latter apparatus included two rotary plows and four pneumatic plows.

The actual snow-fighting operations were directed by the management, including the superintendents of the elevated and



surface lines while the superintendent of the mechanical department was on hand to furnish at least one mechanic for each machine and to direct emergency repairs. Provision had been made also for an emergency repair gang at the Fifty-second Street surface shops so that crews reporting breakages could have spare parts supplied and forwarded without delay. In fact, only one plow was permanently disabled and this occurred because of a broken steel side-sill. The wrecking cars were also kept busy as quite a few passenger cars were derailed through being lifted bodily by the masses of snow packed between the rails. Naturally, these accidents seriously delayed the progress of the snow-fighting machinery. The worst blockades occurred in the open country where the wind piled the snow on the tracks in immense drifts. It was impossible to restore full service on some of these outlying roads until Dec. 29.

The conditions which were encountered between Brooklyn and Coney Island by the trains of the elevated division may be conceived from the accompanying illustrations. In past winters even heavy snowstorms were successfully fought simply by running trains of empty motor cars up and down the line with out using any plows or sweepers. In this case, however, the heavy cross-wind piled up the snow so fast on the open sections that the cars were helpless until the wind had greatly diminished in velocity. Very effective work was rendered by the company's electric freight locomotive No. 4 which had been fitted with a nose composed of two wings of No. 6 steel plate 4 ft. high and 9 ft. 1 in. long. These wings were long enough to extend over the exposed current rail on either side but could not come into direct contact with the latter owing to the interposition of wooden blocks set in angle irons. The locomotive weighs 7 tons and is equipped with four 150-hp motors.

The foremen of the different snow-fighting gangs had full authority to provide their men with all necessary food and drink from the most accessible restaurants without charge. The men were paid from the time they were called for duty until they were relieved. As an example of the difficulties encountered on Dec. 25, it may be mentioned that four girl telephone operators at the company's main switchboard remained at their posts for 18 to 20 hours before members of the relieving staff could reach headquarters.

**POWER CONSUMPTION TESTS OF CARS IN CLEVELAND**

Through the courtesy of F. W. Coen, vice-president and general manager of the Lake Shore Electric Railway, additional information is available in regard to the method of conducting the tests in Cleveland to determine the power consumption of interurban and city cars within the city limits, the results of which were published on page 1020 of the issue of this paper for Nov. 13. The test of the power consumption of the city cars, shown in Table II, was made over the entire routes used by the interurban cars while on the city tracks, and the results as given in the table were an average of 2.8516 kw-hours per car-mile and 125.6454 watt-hours per ton-mile. The test of the power consumption of the interurban cars, shown in Table I, was for a portion of this mileage only, or that within the city limits, and the results were 2.8982 kw-hours per car-mile and 91.5207 watts per ton-mile. A second test was then made to determine the consumption of the interurban cars over the routes for which the city cars had been tested, and the results were about 3 per cent lower than those for the tests of the city cars; that is, they showed for the interurban cars 2.7854 kw-hours per car-mile and 88.2993 watt-hours per ton-mile.

Preliminary surveys have been made for a projected electric railway between St. Petersburg, Russia, and Imatra.

A proposal has been made to convert to electric operation all of the railways on the Isle of Wight. The plan has met with the approval of the municipal authorities on the island.

**STATIC DISCHARGE SETS AT CHICAGO SUBSTATIONS**

At several of the substations of the Chicago City Railway, in which 1000-kw and 2000-kw rotary converters are used, a unique form of trouble with static electricity has been experienced and corrected during the past two years. The static discharges caused severe arcing from the a.c. collector rings and the d.c. bus rings to the boltheads and other grounded parts of the rotary-converter frames. In some instances the sparks from these discharges broke down the insulation on the bus rings and jumped an air space of 1 3/4 in. to ground. As a remedy

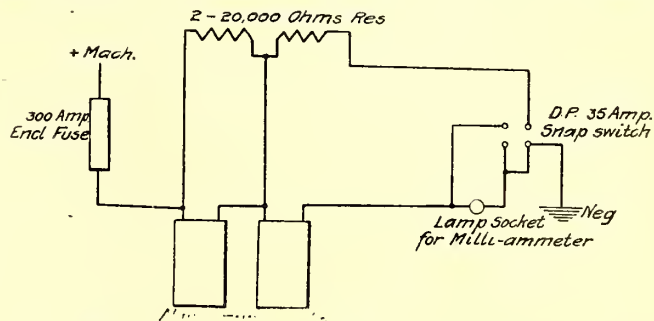
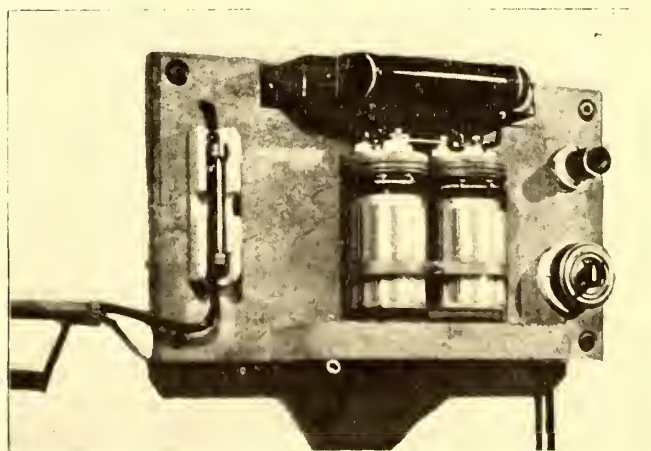


Diagram of Connections of Static Discharge Set

electrolytic arresters were installed for each machine, and so far they have apparently stopped the disturbances.

When the trouble first appeared it was thought that the high voltage might be due to surges on the a.c. cable lines which feed the substations. Attention was given first to the conditions at the Sixty-third Street and Wentworth Avenue substation where there are three 2000-kw and three 1000-kw General Electric rotary converters. Current is received through five three-conductor, lead-covered underground cables having an average length of about 7 miles. Tests were made with spark gaps and with voltmeters to see whether or not the flashing might be due to line disturbances, but no unduly high potentials were thus found, so the engineers in charge of the investigation concluded that the flashings about the rotary commutators were due to static disturbances. A condition in opposition to this view was that the outgoing lines distributing the current taken from the rotary commutators were fully protected with lightning arresters inside the station. On the d.c. switchboard



Static Discharge Set of Chicago City Railway

at the Sixty-third Street substation there are nearly 40 feeder sections and each outgoing trolley feeder is protected with a GE M.D. lightning arrester, and the station busbars are similarly protected. The spark gap points are set less than 1/8 in apart. At first thought, therefore, it seemed reasonable that if the revolving parts of the rotary converters were heavily charged with static electricity the large number of lightning arresters on the outgoing feeders should serve to carry the static charge to ground. As they did not do so, though known to be in good condition, the following conclusion was reached.

The surface of the armature of a 2000-kw rotary is enormous compared with the surface of the positive connection between the d.c. bus rings and the switchboard buses, and the feeders to which the lightning arresters are connected. Hence, the accumulated static charge on the machine is throttled in its passage to the switchboard by the small area of this positive connection and finds a more direct path to ground by puncturing the tape insulation on the bus rings and jumping across nearly 2 in. of air space to the grounded frame of the rotary.

This explanation of conditions seemed sound to the investigating engineers and they next looked for some means which would serve to offer a continuous discharge path for the accumulation of static charge from the positive bus ring direct to ground. Representatives of the General Electric Company suggested the use of aluminum-cell, electrolytic lightning arresters, and the installation of one pair of these arresters for each rotary converter at the substation has been the means of preventing the recurrence of the static discharges between bus rings and grounded parts of the machine. Two 250-volt cells are connected in series between the bus ring and ground. Each cell has a balancing resistance of 20,000 ohms connected around it. The cells were first tried without this resistance, but it was found that the continuous discharge between the elements would unbalance the resistance of the cells so that one might have an apparent drop of, say, 220 volts and the other 330 volts, thus bringing about a heating of the cell with the higher drop. By the addition of the 20,000-ohm resistance in shunt with each cell the drop across the two cells is balanced, and with the cells at 250 volts no heating occurs due to the continuous passage of the dynamic current of less than 1/30 of an ampere. The condition of each cell is tested about once a month to see if the current being discharged is normal. A lamp socket has been installed to provide an easy way for inserting a plug carrying ammeter terminals and obtaining a reading of the amount of current passing through the cells, to ground. A check is also kept on the temperature of the cells, as this gives a good indication of their condition.

When the first electrolytic arresters were installed at the Sixty-third Street substation, special care was taken to make the connections as direct as possible and to use as large conductors as though a lightning arrester was being installed. These precautions have since been found unnecessary and now the cells are connected with the bus rings by No. 6 wire enclosed in iron conduit.

A 30-amp capacity non-arcing enclosed fuse forms a part of this circuit, and as this fuse is held in clip terminals it also serves as a switch for cutting the electrolytic cells out of circuit. The fuse, resistance coils, the two cells, the lamp socket for the ammeter connection and a double-pole snap switch for cutting the socket in series with the cells are all mounted on a panel and shelf built of gray slate, 1 1/2 in. thick, 13 in. high and 22 in. wide. One such static discharger set is installed in the machine pit under each rotary converter. In placing the sets care was taken to mount them at one side under the edge of the floor so that should any undue disturbances take place no damage would be done to the rotary converter.

Until these static discharger sets were installed the troublesome sparking occurred rather frequently at the Sixty-third Street substation. It is now just a year since this substation was equipped with the sets here described and there has not been a single recurrence of the trouble.

USEFUL CHART FOR HEADWAY CALCULATIONS

H. M. Wheeler, assistant chief engineer, Chicago Railways Company, has developed a chart which he has found useful in studying schedules and determining feeder capacities. The chart is a valuable aid in any railway engineering or transportation office. For example, if the schedule speed on a line is known and any one of the following quantities—headway in seconds, headway in feet, cars per mile—is given, all the others of these quantities may be obtained quickly by reference to chart. This chart also is useful in showing the absurdity of some assumed schedule conditions.

The accompanying reproduction of the chart as used in the engineering office of the Chicago Railways Company shows the principal curves and some auxiliary lines used for demonstration. In the use of the chart the variable quantities are headway in seconds, headway in feet, or distance the cars are apart, and the number of cars per mile. The chart is drawn with rectangular co-ordinates and the abscissas represent either headway in seconds or cars per mile. The ordinates represent feet. The derivation of the curves and their practical use follow:

DERIVATION OF CURVES

The hyperbola is first located on the co-ordinate paper. This

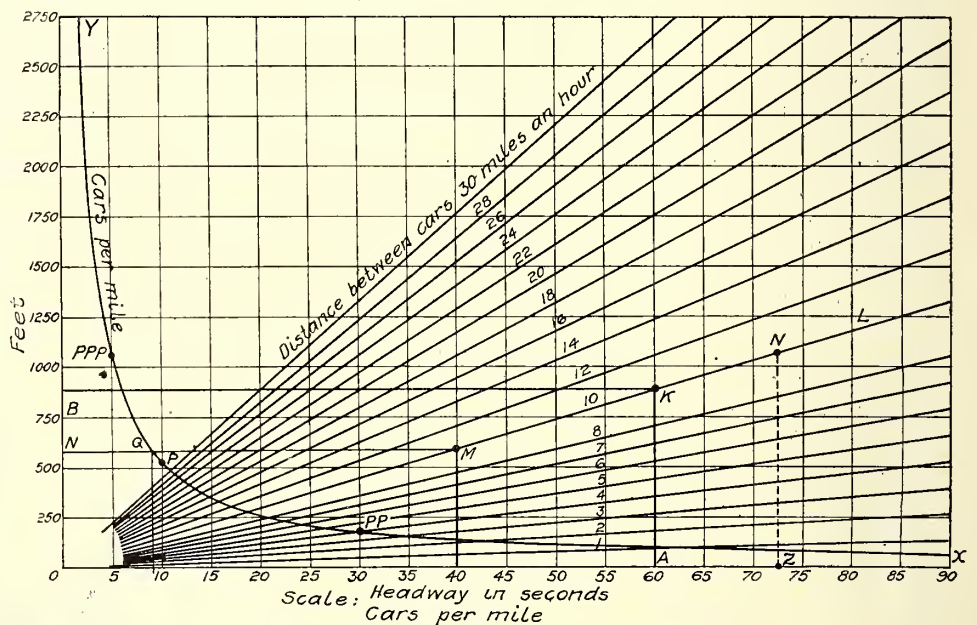


Chart for Making Headway Calculations

hyperbola is known as the cars-per-mile curve and by definition the product of the abscissa and ordinate for any point on such a curve equals a constant. The equation for this curve is  $XY = 5280$ , where  $X =$  cars per mile and  $Y =$  distance apart in feet. The method of plotting is to assume, say,  $X = 10$  cars

per mile; then,  $Y = \frac{5280}{10} = 528$  ft. = the distance between cars.

By erecting perpendiculars at  $X = 10$  and  $Y = 528$ , one point ( $P$ ) of the curve is located. Similarly if 30 cars per mile are

operated  $Y = \frac{5280}{30} = 176$ , and plotting as before,  $PP$  is found

as another point on the equilateral hyperbola, or cars-per-mile curve. In practice the curve is constructed graphically by laying off multiples and submultiples, after the point  $P$  has first been determined.

With this curve and knowing either the distance between cars in feet or the number of cars per mile, the other quantity is easily found by projection. If, for example, it is known that there are five cars on a certain mile of track, the distance between those cars is found on the chart by erecting a perpendicular from the point 5 on the horizontal scale to the point of

intersection with the hyperbola, *PPP*, and extending a horizontal to intersect the vertical scale where the distance between cars is shown to be 1056 ft.

With the cars-per-mile curve plotted, the next step is to establish on the chart other lines, the location of which will include the element of time (headway in seconds) for the horizontal scale, and the element of distance (feet) for the vertical scale. These additional lines will then show graphically the headway between cars at known speeds per hour. The same scale is employed, so that the headway between cars, reckoned either in time (seconds) or in distance (feet), may be used jointly with the curve showing the relation between the number of cars per mile and the distance between these cars. In establishing the cars-per-mile curve the horizontal scale is divided to indicate cars per mile. In establishing the headway lines the same subdivision of the horizontal scale is used to indicate time (headway in seconds). To reduce miles per hour to feet per minute we

$$\text{have } \frac{5280}{60} M = 88 M = \text{ft. per minute when } M = \text{m.p.h. As-}$$

sume that it is desired to establish the headway line for cars traveling at 10 m.p.h. Then the distance apart of these cars on a one-minute headway is  $88 \times 10 = 880$  ft. Thus, for 10 m.p.h., 880 ft. is the distance headway corresponding to the time headway of 60 seconds. Erecting perpendiculars from the 60 second mark (*A*) on the horizontal scale and from the 880-ft. point (*B*) on the vertical scale, the intersection is found at *K*. By derivation then, *K* is one point on a 10-m.p.h. headway line. Next draw the line *OKL* and assume that this is the 10-m.p.h. headway line and that if perpendiculars are let fall to the base line from any point on *OKL*, the length of these perpendiculars, according to the scale of co-ordinates used, will indicate the relation between the headway in feet and the headway in seconds for cars traveling at 10 m.p.h. It is apparent that so long as the speed of the cars is constant, changes in the headway in seconds bring about changes in the headway in distance.

To prove that the line *OKL* truly represents the relations between headway in seconds and headway in feet, take any other headway in seconds, such as *OZ*; laid out on the same horizontal scale. Next, draw the line *ZN*. Now the triangles *OAK* and *OZN* are similar; whence  $OA:OZ = AK:ZN$ . Thus, with the fixed miles per hour line (*OKL*), it is seen that the headways in seconds or in feet represented by perpendiculars dropped from any point on this line are proportionate to the headways represented by the perpendiculars dropped from any other point on the line; and as the ratio between the headways represented by the lengths of the perpendiculars is constant, 10 m.p.h., this is the 10-m.p.h. line.

Lines to represent other headways are laid off with the dividers by using multiples and submultiples on any vertical. In practice they are laid off at the extreme right of the diagram so that the error may be kept at a minimum.

METHOD OF USING CHART

The practical use of this chart will next be considered. Suppose a schedule of 10 m.p.h. is to be established and knowing the headway to be 40 seconds it is desired to learn the number of cars per mile and the distances that these cars are apart. The unknown quantities are found by reference to the chart in the following manner: A perpendicular is erected from the point 40 to intersect the 10-m.p.h. line at *M*. A horizontal is projected from *M* to the vertical axis *N*. Reading the vertical scale it is found that the distance between cars will be 587 ft. Next, from the point *Q* where the line *MN* intersects the hyperbola, a perpendicular is dropped to intersect the horizontal scale and it is found that approximately nine cars will be operated in a one-mile section.

The load on a trolley section may then be found by multiplying by the length of the trolley section the number of cars per mile. This gives the total number of cars operating on the section. Then by multiplying by the load per car the total load on the feeder is found.

This chart also is useful in quickly determining how close to each other cars may be operated and what the headway in

seconds will be. The process of using the chart will be the same for the latter problem, except that the headway in feet will be assumed rather than the headway in seconds.

FEEDER DROP

Mr. Wheeler has devised another chart which is used for quickly reading cable drops. In general but two sizes of trolley feeder cable are used by the Chicago Railways Company. These are the 1,000,000 circ. mil and the 500,000 circ. mil sizes. A load of 75 amp per car is used in calculating drops. First the drop through each of the two sizes of feeder is found for the convenient distance of 8000 ft. A chart is then laid out with rectangular co-ordinates. The abscissas are feet, from zero to 8000, and the ordinates are drop in volts for the load of one car. The calculated drop in each size of cable is plotted on the 8000-ft. ordinate and a line is drawn from each point so located to the origin. Since the drop is proportional to the distance the drop for any distance less than 8000 ft. may be obtained quickly with the dividers.

In determining the drop between a cable tap and two substations (*A* and *B*) feeding a trolley section over unlike distances and through cables of different capacities the following method is used: The load is assumed to be concentrated at the point where the two feeders join the trolley. In practice the connecting cable from this point to either substation is made large enough to carry the entire load with one of the substations out of service. Assuming that substation *A* is inoperative, then *V* will represent the drop from substation *B* to the feeding point. Similarly with substation *B* cutoff *v* will represent the drop from substation *A*; then if the two substations are operated in parallel the drop to the common feeding-in point

$$\text{will be } \frac{Vv}{V+v}.$$

This formula, it is noted, is similar to and may be

proved in the same way as the formula for the combined resistances of two conductors in parallel. Where two lines of track intersect, the car headway resulting from the combination of the headways on the two originating lines can be determined by the same method. In other words, if *H* equals the headway on one car line and *h* equals the headway on another line and these

$$\text{two lines merge, the resulting headway will be } \frac{Hh}{H+h}.$$

**PUBLICITY DISCUSSED AT THE NEW ENGLAND STREET RAILWAY CLUB**

The December meeting of the New England Street Railway Club was held at the American House, Boston, on the evening of Dec. 30. The paper of the evening was on "Educating the Public in Relation to Electric Railways" by James H. McGraw, president of the McGraw Publishing Company. An abstract of the paper will be found elsewhere in this issue. As Mr. McGraw was prevented by illness from attending the meeting, the paper was presented by Henry W. Blake.

DISCUSSION

Lec H. Parker, Stone & Webster, Boston, opened the discussion by inquiring what the results had been in the way of increased traffic upon the London Underground Railway, following the advertising campaign described by the paper and illustrated in the posters.

George Sabin Brush, Boston Elevated Railway Company, said that he had recently heard from General Manager Albert H. Stanley, who had written him, that an increase of 15 per cent to 20 per cent in the tariff is attributed to the advertising conducted by that company.

M. V. Ayres, Boston & Worcester Street Railway Company, commented upon the completeness of the paper and its interest at this time. Ever since the panic the question of stimulating traffic had been of more than ordinary importance. Public-service corporation officials stand in a different relation to the public than the heads of departments in other lines of business. It is most important that the public be educated to

maintain a sentiment favorable to the companies. Human beings are largely creatures of habit, and in recent years the public in some cities have acquired an unfortunate habit of picking flaws in the transportation service. One can pick flaws in anything, for that matter, but this is not an attitude to encourage. It is not uncommon for people away from home to boast about the high buildings; broad streets, parks, rivers, etc., in their city. If they have a good electric railway system they should be equally proud of it, and it is an excellent plan to educate them to know when they are getting good service. This means lower verdicts from juries in accident cases, better co-operation from the local police authorities and their subordinates, help from the newspapers, fewer adverse bills introduced into the Legislatures, and less obstruction of desired improvements from municipal authorities. Mr. Ayres closed with the recommendation that electric railway men give the newspaper representatives a cordial welcome and acquire their friendship. In this way much can be done to eliminate the "featuring" of accidents in staring headlines on the front page, while good points about the system are relegated to a remote corner of the paper and printed in small type, as well.

A vote of thanks was then passed to Messrs. McGraw and Blake for the presentation of the paper, and the meeting adjourned.

**PAY-AS-YOU-ENTER SERVICE STARTED IN BALTIMORE**

On Saturday, Jan. 1, the United Railways & Electric Company, Baltimore, Md., successfully inaugurated service with the pay-as-you-enter cars described in the Jan. 1 issue of the ELECTRIC RAILWAY JOURNAL. The introduction of the cars was preceded by a brief but vigorous publicity campaign in the cars of the company and in the daily newspapers.

The two large posters reproduced were prepared for dasher and inside use, respectively, and placed on all lines. The first poster gives directions for boarding the car, depositing the fare, entering the car and leaving by the front exit. There is also a rear exit, but the passengers are being educated to use it only in emergencies. The second poster announced the date of opening of the service on the Pennsylvania Avenue line, and

**PASSENGERS ON**

**Pay-As-You-Enter Cars**  
 Will please  
 Get on by rear platform step marked "IN."  
 Have exact fare in hand when boarding and deposit in fare-box.  
 Enter car as soon as fare is paid and move forward.  
 Leave car by main exit—front platform.

THE UNITED RAILWAYS & ELECTRIC CO.

Poster Displayed on Dashboards of Cars

also gave boarding and alighting directions. Besides this, the company distributed a folder which contained a floor plan of the pay-as-you-enter cars, together with a half-tone illustration of one of the cars and views showing the proper use of the rear and front platforms. The text of the folder was printed in English, German, Jewish and Italian, since Baltimore has become quite as cosmopolitan as New York. To insure reliable translations, W. A. House, president of the com-

pany had these polyglot folders printed in New York. Most of the English portion of this novel folder was arranged to explain the benefits and principles of the pay-as-you-enter cars in parallel columns, as follows:

**BENEFITS OF P-A-Y-E CARS**

Conductors are not permitted to leave their compartment on rear platform; as a consequence jostling of passengers by conductors when collecting fares is eliminated and the danger of premature starting of cars is overcome.

Since passengers are not allowed to ride on rear platform, the crowding of the doorway by smokers—a particularly objectionable feature to ladies—is corrected.

By separating the avenue for boarding cars from those for leaving it, ingress and egress are orderly and without confusion, while the stopping time at corners is reduced by nearly one-half.

Through restricting passengers to interior of car, the carrying capacity is reduced; consequently the company will be required to operate more cars, thereby insuring a larger proportion of seats to the patrons.

**PRINCIPLES OF P-A-Y-E CARS**

Board car only at rear platform by step marked "In."

Have exact fare in hand and deposit in fare-box; have ticket or transfer (unfolded) and hand to conductor.

Ask for transfer on paying fare. Persons desiring information or money changed should step to extreme rear of platform, so as to allow other passengers with exact fare to pass into car.

Passengers will leave car by front exit, getting off at step marked "Out." The small right-hand rear doorway is an emergency exit; when necessary to use it, leave car through conductor's compartment and get off rear step marked "Out."

As it is necessary to keep both platforms clear for entrance and exit of passengers, smoking is not permitted. Packages are not to be left on rear platform.

By the intelligent co-operation of the public, the company will be able to raise the standard of service on this line to the highest excellence yet attained in street railway operation.

**UNITED RAILWAYS & ELECTRIC COMPANY**

The company also printed a booklet containing special rules and instructions for the government of dispatchers, receivers and carmen in applying the pay-as-you-enter system of fare collection with cash boxes. In the sections addressed to the motormen and conductors, particular stress is laid on the pre-

**Pay-As-You-Enter Cars**  
 COMMENCING  
**SATURDAY**  
**JANUARY**  
**1ST**  
 Will be put in service on  
**PENNA. AVE. LINE**  
 Passengers will please—Have exact fare in hand when boarding car.  
 Get on by rear platform step marked "IN."  
 Leave by front doors.

Car Poster on Pay-as-you-Enter Service.

vention of accidents made possible by the better control of the platforms. This booklet was also illustrated with a plan and platform views of the cars.

Engineers of the Chilean Government are making preliminary plans for the electrification of the first section of the Government Railways from Valparaiso to Santiago, 115 miles.

## EDUCATING THE PUBLIC IN RELATION TO ELECTRIC RAILWAYS\*

BY JAMES H. MCGRAW, PRESIDENT, MCGRAW PUBLISHING COMPANY

Public sentiment is a power. How to enlist that power in our cause is a subject that may well occupy our careful attention this evening.

President Shaw in his admirable address at the Denver Convention referred, among other things, to the magnitude of the electric railway industry as well as to the vast army of men who are directly affected by the prosperity or lack of prosperity existing in the electric railway industry. The six States represented by this club possess 17 per cent of the aggregate number of cars and 13 per cent of the miles of track in the United States. If we also include, as Mr. Shaw did, those who are engaged in the manufacture of electric railway apparatus and the investors in any or all of these various undertakings, the number of men in New England who are interested in the material development of the systems and in the proper direction of public opinion as regards their real conditions of operation, the percentage is undoubtedly vastly larger than in either of the two comparisons made above.

Publicity appears, on analysis, to mean "all things to all men." There is a dictionary definition, but the strict meaning of the word is not so good for our purpose as a consideration of the subject from the practical commercial standpoint; that standpoint is the one which concerns us directly. My definitions will be, if you please, business definitions, based upon the results of application of the policy of publicity to the affairs of electric railways. It seems to me that from this point of view there are three definite lines of action, the adoption of any one of which may affect the revenues and therefore the prosperity of a street railway property.

*First:* The publicity which aims simply to advertise the service; that is, to increase the business.

*Second:* The publicity which aims to make the public familiar with operating problems and with certain aspects of questions bearing on taxation, fares and transfers.

*Third:* The complete publicity through commissions which prevails in some States, notably in Massachusetts, New York and Wisconsin.

Of course, it is impossible to give publicity in any one of these distinctive forms without approaching the other forms at some points, but on the whole the three separate types of publicity stated indicate tolerably well the present practice of our railways.

### PUBLICITY DESIGNED TO ADVERTISE THE SERVICE

The earliest form of publicity is the first, that which is designed to advertise the service. In the early days of electric propulsion the facilities available did not justify extensive advertising, although almost any kind of a safe, dependable conveyance was something of a public convenience and necessity. Since that was a fact 20 or 25 years ago, it must be plain that companies of the present day, having infinitely more to give in service and equipment, have so much more to promise patrons in return for the still small fare, and it becomes a business error to overlook the opportunity.

Good advertising assures publicity. Whether a street railway has anything to offer which it can advertise with profit to itself is not a debatable question. The only argument rests on the extent of the advertising campaign and on the time and manner by which the utmost results can be attained through a fair expenditure of energy, money and brains.

The reasons which control the answer to this question must be many and varied. They relate to the mileage of the railway system, the natural attractions reached, the proximity of the business and residence sections, the character and habits of the population and many other features. Other questions are involved than those which relate to the financial expenditure required for an advertising campaign. Anyone can see that

a system operating 450 miles of track has an advertising problem radically different from that which confronts the 12-mile road. But it requires a little more thought to differentiate in advertising between an industrial population and a community in which there is a large proportion of property holders. The large system may do its mere advertising of service so effectively that it will greatly increase the long-haul travel and thereby make a possible loss, when its facilities might otherwise have been employed in handling a smaller amount of very profitable short-haul traffic. During his brief control of the Cleveland Railway, Mayor Johnson made many mistakes from an operating standpoint, and one of them was that when he experimented with a low rate of fare, thinking that it would attract short-haul traffic, he failed to give sufficient service to accommodate short-haul passengers.

In planning an advertising campaign designed to increase the patronage, it may safely be assumed that some of the residents of the one or more communities reached have little knowledge of the ways in which the service can add to their convenience or pleasure. The questions then to consider are these: What particular part of the service, what line, what facilities, what advantages can be advertised in order to develop the increase in the patronage which shall be the most profitable to the company? Each branch of the service should be taken up, one after the other, to determine whether the full measure of public patronage is being secured. Is the company getting all that it should of summer pleasure travel? Do the schedules enable substantially all the passengers who reach or leave the city on the steam railroads to find cars at convenient times and places? Can any improvement be made in the existing service between steam railroad terminals and hotels, as well as outlying sections of the city, so that more travel will be secured? How many fares are lost every day because the people who would take short trips can save time by walking instead of waiting for a car? Local conditions govern the attendance at parks, but it has been found in some instances that unless a satisfactory attendance develops early in the season no large volume of amusement travel of this character will be realized. If that is the general experience, the best time to advertise the park is early in the season.

The real question which we want to consider seriously, however, is the art of directing public attention to the everyday facilities offered by the railway company. I believe that the best foundation for an advertisement lies in the quality of the service. Let the people know that the service is good; and let the advertising be so timed and displayed as to impress the greatest possible number of riders or prospective patrons. Successful advertising of street railway service, like that of a manufacturing commodity, must be alive and interesting. But the performance must always square with the product.

A great many companies have gone extensively into the business of publishing circulars to encourage traffic, and some of these circulars are as elaborate as those issued by steam railroad companies. While there may be some doubt as to the best character of advertising literature and the method of its distribution, there can be none as to the general principles involved. The electric road is always up against the fact, however, that its average fare is 5 cents against the very much larger sum per passenger of the steam railroads.

### ADVERTISING IN LONDON

Comparatively little has been done in this country in the way of poster advertising. This fact is my excuse for referring somewhat at length this evening to the advertising poster campaign recently carried on in London by the Underground Electric Railways Company, Ltd., which has undoubtedly done more in this direction than any other electric railway company. The paper then presented an account of the methods of advertising followed in London. About 25 large posters and a collection of circulars used in that city were exhibited. The latter included a 54 page pamphlet sold for 2 pence containing a map of London in sections, a colored map of the underground lines and connecting street railways and

\*Abstract of paper presented at meeting of the New England Street Railway Club, Boston, Dec. 30, 1909.

an index of the underground railway stations, public buildings, amusement places, hotels, etc. There was also a penny pamphlet with a map of the system and its suburban connection, brief illustrated descriptions of the sight-seeing points in and about London, and a list of the principal theaters, clubs and steam railroad terminals in connection with the nearest subway station. The free pamphlets included one of the pleasure resorts in and about London with information on fares; a book folder on places of interest in the city, giving the conditions of admission when open and to what points tickets should be bought; book folders containing season ticket rates showing map and list of excursion fares, including admission to Earl's Court; map with list of principal places of interest and subway interchange stations; guide to the schools and colleges; guide to the churches and chapels; time table with list of the railway terminals; individual pocket cards giving time-table of late theater trains with map of theater districts; monthly diary of events in and around London with rates of fare schedules of non-stop service; schedule of bus service connections at suburban terminals, and a colored book map of the London tubes printed on linen backing.]

#### PUBLICITY TO MAKE THE PUBLIC FAMILIAR WITH OPERATING PROBLEMS

The second aspect of the phases of publicity which we are considering is a development of recent times. It is a result of the onslaught against corporate management which has been so serious a feature of our business life lately. What was the position of the corporation in the years that preceded these attacks? Its voice was never heard in defense or explanation. Now the time has come to talk. A campaign against corporations finds support because the public does not understand the operating and financial problems with which the managers of these properties have to deal. It is easy to say that all the properties are over-capitalized and pay excessive profits and that fares are too high. This and more has been said and believed by a large clement of the public in more than one community. Any politician with a grievance who wanted a following could secure it with ease by talking against public service corporations. Now, these corporations, standing on their legal rights, can refuse to answer such attacks. But wiser policies are prevailing and to the recognition of publicity as a means for education of the public is due, in part, the progress in the understanding regarding corporate affairs which has taken place.

The misunderstandings between the public and the street railway are almost wholly due to ignorance on the part of the public as to the details and difficulties of traction operation and management. If the public is educated through publicity, and its confidence is gained, half of the troubles of a public utility company are over. The public knows nothing about the troubles of the public utility company. It only sees a stream of nickels pouring into the company's treasury, and it often believes that some desired or objectionable feature of service is either refused or maintained out of indifference to the public desires. In almost every case of this kind the demand or opposition could be satisfied by explanation. This applies with equal force to such problems as taxation and transfers, details of service, and to labor problems. Publicity can secure public support in a labor controversy, or it can prejudice the whole community against the company.

Some of the deeply rooted notions and prejudices which have been developed in relation to the profitableness of great railway enterprises would be ludicrous if they were not serious. People assume that street railway companies pay taxes, but generally have no knowledge of the large sums extracted from these properties not only in direct taxation, but indirectly in the kindred nature of public benefits. The ignorance of the public has not been confined to these questions alone. Transfers have been distributed with so free a hand that the public has never considered their value. The man who rides 2 miles to his office every morning does not realize the large number of people who ride several times this distance. If a car is

accidentally delayed, the neglect of the company in allowing such accidents to occur is regarded as a wilful offense. If cars are not operated on a headway calculated to meet the personal convenience of each passenger, there are many who cherish ill feeling.

This condition arises partly from a natural tendency on the part of many to exaggerate every evil, apparent or real, and to ignore or belittle the good that is being done. I doubt whether any of those present has ever seen a news story to the effect that there has not been a single accident on his lines for 30 days. But if one of his cars bumps a wheel off a wagon to-morrow the occurrence will be chronicled on the front page of the newspapers. This illustrates the necessity for systematic publicity that will tell the good news along with the bad news.

There are two points of contact between the company and the public, so far as this branch of publicity is concerned, of which I will speak briefly to-night. One is the newspapers, the other is the employees themselves.

The subject of the relations of public utility companies with the newspapers is a very broad one, and I do not mean to go fully into it. But it is undeniable that newspapers make public opinion, and it therefore follows that some steps are necessary to secure a fair presentation of public corporation affairs in the newspapers. This is a condition; not a theory. I need not discuss the desirability of this condition of affairs. It exists and is to be dealt with just as any other situation, desirable or undesirable, is to be met and handled. In some cases this educational work can be accomplished by no greater expense than the salary of the publicity man. In other situations the company must pay for advertising space in which to tell its side of the story.

The secret of this kind of advertising is first to emphasize the fact that the company has nothing to conceal from the public in the way of its earnings or details of operation, and second, that in return the company expects to receive from the public its necessary co-operation, as well as equal fairness in its judgment upon matters connected with the company.

In this, as in all general publicity work, the company must act as though the public was in utter ignorance of its service. If it does this the assumption will not be far wrong. The average manager is too close to his work, and knows too much about it to realize how little outsiders know.

The choice of a man for carrying on this kind of publicity work is all important. Daily newspaper men have the best equipment for the job, but not every newspaper man can do it. It requires a "news sense," plus a knowledge of how public opinion is formed, plus the capacity to grasp the corporation viewpoint. The duties of such a man, however, will not be confined to preparing announcements of this kind. Indeed, on most roads and at most times his immediate work would be that of supplying the public, press and others with information and facts in regard to the company and its facilities as may be required.

One would suppose, for instance, that everybody in Philadelphia knew how to reach the Wissahickon district, the northern section of Fairmont Park. But the publicity man of the Philadelphia Rapid Transit Company discovered that the Park Department received frequent telephone requests for information as to means of reaching various points. He had a post-card map made showing the line to the Wissahickon district and advertised that the map could be had for the asking. The next day there were hundreds of requests by mail and in person for the map, and these applications have kept up steadily for two months.

Of course, the principal desideratum in work of this kind is not necessarily that there should be a special man with the title of publicity agent or manager, but that there should be an orderly and systematic manner of taking care of legitimate requests for information, for anticipating these requests when possible and for seeing that the company's side of any public question is properly presented. Sometimes this work can be

undertaken by the manager, but on many roads he is too busy to attend to it. Whoever has it in charge should necessarily be in touch with the policy of the company in regard to matters of publicity and be easily accessible by the newspapers.

The president or general manager who does not take a long reach, so to speak, and utilize to its fullest extent the kind of publicity of which I have just been speaking, and does not know what others are doing in this respect, is not fair to himself, or to his company, or to the industry at large.

The second point of contact between the company and the public is through the employees. The officers of an electric railway company see and meet a few only of the patrons of the company, but the conductors meet them all, and the impression which they convey to the public as regards fairness, intelligence and politeness is usually that which the public attributes to the company as a whole. It is somewhat disquieting for any person to feel that his reputation for these qualities has been entrusted into the hands of another, and still more when given into the hands of several hundreds or thousands of others. But this, to a large extent, is inevitable on every electric railway system. It is a condition which we cannot avoid, but which we can control and improve.

#### PUBLICITY REQUIRED BY COMMISSIONS

The third form of publicity to which I have referred is that required by law in regard to access to the company's records by commissions representing the public. In Massachusetts the commission has in addition broad recommendatory and mandatory powers, while in New York and Wisconsin the commissions are acting under laws which, according to their interpretation, confer the most important mandatory powers respecting all vital questions of management, finance and operation. The question which I am to discuss in this connection, as I understand my topic, is not to differentiate between the powers conferred by law upon these respective commissions, or to take up the character of their work, but to consider the extent to which this kind of publicity is in the public interest.

Let us look back a few years. The construction of street railway properties in the early stages of development of these enterprises was a rich field for the promoter. But as time passed these properties became more and more monopolistic in character until, to-day, in most communities it is regarded as in the public interest to have one corporation in control of all of the urban railway facilities. The program of construction, development and sale of railway properties in the future must, therefore, be confined largely to properties in new, or comparatively new, districts which are now without adequate railway facilities. I do not mean that there is no longer a place for the promoter of street railways. Without the promoter, many electric railways which provide indisputable facilities would never have been constructed. Every project of this nature involves elements of business risk which only promoters and the capitalists whom they are able to enlist appear to be willing to assume at the initial stage. While the promoter therefore will find opportunity for construction as new sections of the country are opened to settlement and as population increases in existing districts, which were now without urban and interurban facilities, it will be found that for the great majority of existing properties safety and conservatism point the way to operation as differentiated from promotion. It is better for all concerned that street railways should be considered as going properties with a fixed investment without excessive over-capitalization and that no community should have the right to destroy capital investment. A reasonable return should be allowed on the investment in the business with compensation for unusual efficiency of management. These conditions are more likely to prevail where the public knows the truth about the property than where the essential points are buried in mystery.

Taken by itself, publicity of all the intimate details of the accounts and records of properties of this character will not, cannot, create ideal conditions. The mere passage of a law, the mere creation of a commission, the making public of records pertaining to financial and operating questions will not create ideal conditions, but the careful use of opportunities vested by

law in a conservative commission may be made to redound to the benefit and protection of the public interest. This public interest of which I speak cannot be confined to the interest of the traveling public in the common acceptance of the term, but must include also the equal interest of the investing public and of that class of the public which constitutes the officials and employees of the corporation.

Until this new development became a feature of our government, in some States many of the advocates of commission rule believed that public utility rates generally were too high and that the consuming element of the community needed protection from excessive rates. The real fact of the matter is that inquiries into the cost of operation have led to discoveries which have been astounding to many and in more cases have led to increases rather than to decreases in rates. In a number of instances the public has been getting its transportation for years at less than a fair cost, plus a reasonable return. Since our interest lies in the perpetuation of these railways as solvent properties, we can but admit that wise commission rule may tend to that end.

Electric railways have been fortunate in having had a fair investigation of some of these problems. So long as governmental inquiry is conducted carefully and a wise control is exercised over properties which have been subject to many vicissitudes in the past, the ultimate outcome should be beneficial. It should lead inevitably to a final swing of public sentiment toward a far better understanding of corporate relations than previously existed. And public sentiment, once gained, is a controlling element in the success or failure of any business enterprise, corporate or individual.

#### CONCLUDING REMARKS

Finally, I do not advocate publicity as a royal road to public favor and support. Every electric road has lubrication troubles, no matter how much oil and grease it buys. But no road would think of trying to operate without any lubricant. Publicity work is much the same way. When properly directed it will increase the receipts; it will bring about a better understanding between the company and the public; it will assist the company to gain a fair hearing in cases of conflict, public, private and political, and it will help to secure unprejudiced juries in accident cases. The life of a street railway man will never be an easy one. But publicity of the kind I am talking about will make his work much easier than it can ever be in an atmosphere of criticism and hostility.

### PROPOSED BERLIN EXPOSITION OF AMERICAN ART AND INDUSTRY

Plans are now under way to hold an exposition of American products in Berlin, Germany, during the months of June, July and August, 1910. The projectors are receiving the encouragement of the highest officials and prominent citizens of both Germany and the United States. The American committee which has been organized, with headquarters at 50 Church Street, New York, has already issued a prospectus outlining the scope and practical advantages of the exposition. It is pointed out that the cost of exhibiting will be reduced to a minimum, as the German Government will waive the customs duty on all goods not sold eventually, and the Hamburg-American and North German Lloyd steamship lines will grant a freight reduction of 30 per cent on exhibits both ways. Furthermore, each exhibitor will have to pay only one fee, which will cover space, lighting, decorations, packing, policing, insurance, advertising in the official catalog, etc. This absence of extras will save the exhibitors considerable expense and annoyance, besides enabling them to calculate their costs accurately in advance.

B. S. Josselyn, as president of the Portland Railway, Light & Power Company, has contributed \$7,500 toward the expense of the Rose Festival to be held in Portland from June 6 to 10, 1910.

## VALUATION OF PUBLIC SERVICE CORPORATIONS\*

BY W. H. WILLIAMS, THIRD VICE-PRESIDENT, DELAWARE & HUDSON COMPANY

The value of a railway lies not in its physical property, but in the use of that property. Value begins with use and increases as use increases.

The things that secure a broad, extensive and profitable use are, therefore, the things which give value to a railway. Among these are:

1. The location of the railway with reference to natural resources producing traffic.
2. The location of the routes selected with reference to economical construction and service.
3. Suitable construction and equipment.
4. Such combination of capital and labor, and efficiency of management as will secure the maximum traffic per dollar of expenditure.

Unless there be a profit beyond the investment return, there is no reward for the conception of the undertaking, its economical construction, the subsequent additions of improved machinery and appliances, the introduction of economies of operation, nor the maintenance of harmonious relations with the public and connecting lines, all of which are necessary to secure the greatest amount of traffic per dollar expended.

The following questions present themselves: Can a "fair valuation" be made? By what method should it be reached? For what practical purposes can it be used? By whom should it be undertaken?

"Valuation" seems to relate to "value" and a "railway valuation" would seem to be a process of ascertaining "railway value." Value, however, is a ratio in exchange; that is to say, in commerce. Value, then, is an incident of commerce, and cannot exist without it, and to qualify the term "value" by the word "commercial" is superfluous, for all value must be commercial. When it is proposed, therefore, to undertake something which is not to be a "commercial valuation," it is plain that the thing to be ascertained, whatever it may be, cannot be "value." The thing now proposed is not new, although its advocates have been pleased to give it a new name. What they are really proposing is to ascertain "cost of reproduction less depreciation."

Through laying undue stress upon the present value of material in place, much confusion has arisen regarding the elements entering into value. This is caused largely by using the term "physical valuation" instead of "present cost of reproduction." This confusion has become so great that many regard the present value of material in place as constituting the only element in such value. Little attention has been given to value derived from use. It is unfortunate that so well known a phrase as "cost of reproduction" should give place to one which is little understood and has already proved misleading.

Nothing is clearer than that the present agitation does not contemplate an ascertainment of the actual value of the property.

It would seem only wise and prudent to determine, before incurring the enormous expense incident to ascertaining the cost of reproduction, what relation, if any, it will have to the valuation of the railway; that is, to determine how such cost will be used in arriving at value. If it can be used (and I do not to-day say it can), then consideration must be given to the elements that enter into the cost of reproduction. The plan now most generally advocated is that which has been followed by the several States that have undertaken a valuation of railways. Such valuations were undertaken originally for taxation purposes. There are differences not only in the methods followed by the several States, but there are many items which, as yet, have not entered into the valuation by any of the States and which should receive proper consideration. Among the items that have been ignored or inadequately treated are:

1. Cost of surveys.
2. Rate of interest during construction.
3. Discount on securities sold.
4. Cost of material.
5. Cost of labor.
6. Excavation and embankments.
7. Contingencies and contractors' profit.
8. Effect of machinery on cost of construction.
9. Carrying charges.
10. Impact and adaptation.
11. Special conditions affecting cost.
12. The cost of progress.

The cost of reproduction is a matter of individual opinion. No engineer in estimating on the several important items of construction work for the year will come within 10 per cent of the total aggregate cost. Many of the more important items are frequently underestimated from 25 to 50 per cent. If experienced engineers, knowing the local conditions, cannot estimate the exact cost, how can those without special knowledge be expected to do so. An especially good illustration is that of the Panama Canal. The original estimate of the cost of engineering and construction work was \$139,705,200, but the present estimate is \$297,766,000 (page 18, President's message to 61st Congress), and it is probable this cost will be greatly exceeded.

### RATES.

The Interstate Commerce Commission, even while advocating valuation, does not contend that after it has been accomplished, the regulating authority can proceed generally to utilize the results as a basis for rate-making.

We see that even in the suggestions of Prof. H. C. Adams and of the commission, the question of cost of reproduction occupies but a very small place in the process of determining the reasonableness of a rate.

Bearing in mind that the power to regulate railway charges rests wholly upon the fact that the railway is a common carrier, and extends no further than the power to control the charges of any common carrier, let it be supposed that an individual operating an express wagon upon a public highway, as a common carrier, has invested in his business the sum of \$5,000, and that he performs, within a particular period, 500 services at a uniform rate of \$1 per service, and at an operating expense of 50 per cent of his gross receipts, thus leaving \$250, or 5 per cent for the return to capital. Assuming the rate of \$1 to be reasonable under these conditions, let us inquire:

(a) Does the rate become unreasonable if the introduction of operating economies reduces the operating ratio to 25 per cent, leaving 7½ per cent for return to capital?

(b) Does the rate become unreasonable if, with no increase in capital, the number of services and the operating expenses are both doubled, with the result that capital earns 10 per cent?

(c) Upon the additional assumption that one-half of the capital was originally borrowed at 5 per cent, does the rate become unreasonable if the loan is renewed at 3 per cent, leaving 7 per cent upon the portion of capital actually supplied by the individual conducting the business?

If anyone is disposed to answer the foregoing questions, or any of them, in the affirmative, he should do so with a full understanding that his answer commits him to the principle that those who engage in public service industries are not entitled to the rewards that naturally spring from superior management. If this doctrine should be established, there would be little basis for the hope of further improvement in the methods of public transportation.

The truth is that neither the industries of the country aside from the railways, nor the railways themselves, could exist under rates calculated from a "valuation" upon any such basis as that proposed. It is not meant by this that there is no case in which such a method could be applied without complete disaster, but it is asserted that the general adoption of such a method of rate-making is impracticable. The retail merchant may endeavor to add a uniform percentage to the wholesale price of the goods which he sells, but this desire always yields in the face of competitive conditions, for the price must always be one at which the goods will sell. Under some conditions rates must be made which do not produce what on every other consideration would amount to a "fair return upon the fair value of the property."

\*Abstract of paper presented at a joint session of the American Economic Association and American Political Science Association, New York, Dec. 30, 1909.



The phrase "what the traffic will bear" is generally misconstrued to mean "all that the traffic will bear." What it does mean is: "All that some of the traffic will bear." It can be safely stated that "all the traffic will bear" is charged only in cases where it is found necessary to make reductions from the normal rate in order to permit the traffic to move at all, and that the charge of "all the traffic will bear" is not made for the purpose of securing an excessive rate for the service performed.

#### CAPITALIZATION.

The system of accounts promulgated by the Interstate Commerce Commission makes it impossible that cost of property and par of outstanding securities should be equal. They expressly forbid the capitalization of many construction items amounting to \$200 or less.

That system establishes *depreciation* accounts but makes no provision for *appreciation*. It provides for the arbitrary withdrawal from the accounts of the cost of property prematurely withdrawn from service through additions and betterments, undertaken for purposes of improving the service or more economical operation, and does this without regard to whether capital has been reimbursed for its investment. It does not encourage economical operation, but does offer a premium to any road which increases the cost of property per dollar of revenue received; that is, it encourages a result directly contrary to all economical principles. It does not encourage competition, but does make the strong roads stronger and the weak roads weaker.

It requires the carriers to pay out of earnings many items which should be capitalized. For such of the items as represent property "abandoned to make way for providing the public with better facilities," the statistician of the commission admits that there is merit in the argument of the stockholder that the cost of progress should be capitalized. Notwithstanding this, the commission ignored the claims of the stockholder and did so against the unanimous recommendation of the Railway Accounting Officers, and without granting any formal public hearing.

A good illustration is the question of increasing the tonnage capacity of the track. This can be done by either reducing the grades or building additional main tracks. If the grades are reduced, a large percentage of the cost must be charged to operating expenses. If additional main tracks are constructed, all the cost must be capitalized. By reducing the grades, the capacity of the line can be doubled and the business handled with fewer locomotives and fewer engine and train crews. No such reductions can be obtained through the construction of additional main tracks.

The suggested future use of the present cost of reproduction without a reinventory, but by a process of addition and subtraction, is equivalent to saying that the present cost of reproduction can be ascertained by applying a similar process of addition and subtraction to the original cost of the property. Neither that plan, nor the system of accounts promulgated by the commission, gives due consideration to the effect on capital caused by the premature withdrawal of facilities in the installation of betterments for increasing the productive capacity of the plant. They provide for the systematic taking away from the investor of a portion of the capital which he has invested, without in any way securing to him a commensurate return. In no instance do they provide for appreciation in either the selling price of real estate or in other elements entering into the value of the railway as a going concern. What could make the risk to capital more extensive?

Actual figures will not be continued on the asset side of the balance sheet, but some theoretical prices and figures determined by a "rule of thumb." The only actual cost figures to be continued on the asset side will relate to non-physical property. Thus we see that, although the Interstate Commerce Act authorized the commission to prescribe a system of accounts that only contemplated a *record of the acts of the carrier*, they have attempted a *system of control*, which would permit them to substitute fictitious for actual transactions.

The commission has had no duty to perform which has been, or is likely to become more important than the preparation of a system of accounts for the carriers. This work was delegated to others. While some carriers were consulted by the statistician, those to whom the work was delegated made a number of recommendations to the commission which the carriers believed would seriously affect their ability to interest capital or improve their property to meet the increasing demands of commerce. These recommendations were adopted by the commission against the protest of the carriers, and they most emphatically denied the request of the carriers that a public hearing be had before the promulgation of any system of accounts.

#### EFFECT ON CAPITAL, LABOR AND THE USERS OF TRANSPORTATION.

While asserting "that the public is in partnership in the public service industries," the scheme of valuation fails to recognize that all partners are expected to bring something of value and share proportionately in both the losses and the profits. Professor Adams' scheme, if carried out, would not only cause the investor in railways to stand the loss from any possible reduction in the estimated cost of replacement or in the operation of his plant, but would give to the public any profits that might arise over and above an investment return. It does not, however, contemplate that the users of transportation shall share with the railway investors, any profits that may arise in their business over and above an investment return.

Has capital assumed no risk, and has its reward been unduly high? The processes of liquidation through which many roads have passed, answer the first part of this question. The average return to-day on securities outstanding (which members of the Interstate Commerce Commission, the President of the United States and other persons of authority have publicly stated undoubtedly represent approximately the present value of the properties) is not over 4 per cent.

It should not be inferred that the railways object to having a valuation placed upon their properties. In effect such valuations are daily attempted with greater or less success by subscribers to new issues of securities and even by those who invest largely in securities heretofore issued. There is, however, serious objection to an incomplete and misleading valuation bearing the stamp and carrying the weight of Governmental sanction, which can be of no practical advantage to the Government, the public, or the railways; but may easily injure the public and the railways by disturbing the confidence of the former and hampering the activities of the latter. It seems very clear that such a valuation as is proposed would be wholly useless to the Government for any practical purpose, because it would omit so many factors essential to any fair appraisal of the worth of the enterprises as going concerns. The only purposes suggested are for:

- a Rate-making.
- b Control of security issues.
- c Taxation.

(a) For rate-making.—Unless the Supreme Court overrules its well-considered decisions, such partial valuation cannot possibly form the basis of determination of any rate or rates, general or special.

(b) Control of security issues.—No such control is as yet vested in the commission, nor can it be under the Federal Constitution. There can, therefore, be no advantage in securing such a valuation to facilitate the performance of a function which does not now and probably never will exist.

(c) It is assumed that the taxation referred to is Federal taxation, with regard to which it may be briefly said: (1) A partial and unequal valuation could not be the basis of a fair tax. (2) The Congress has already elected to tax all corporations, including railways, upon their net profits; to which a physical valuation can have no conceivable relation. (3) If in future other methods of taxation should be proposed, to which any valuation is relevant, it will then be soon enough to provide for a valuation which will harmonize with the system under consideration.

## CALCULATION OF TIE LINES BETWEEN STREET RAILWAY POWER STATIONS

BY RALPH H. RICE, E. E., CHICAGO.

In a street railway system of a large city reliability of service is of prime necessity. Such a system is usually served by a number of power houses or substations, and the question of connections between stations is of considerable importance. The object of interconnecting the stations is to reduce the liability of a complete shutdown on those trolley sections fed from a given station if the station should be disabled. By installing tie lines current may be fed into the disabled station from others to which it is connected. The simplest way to accomplish this would be to have between stations several cables or "trunk tie lines" of such total carrying capacity that the current fed into the disabled station from the adjacent ones would be any desired fraction of the total station capacity. Under normal operating conditions these ties would serve as equalizers between the various stations.

The investment for such ties would be quite large and essentially the same results may be secured by selecting a number of the more important trolley sections and feeding them from two stations. The feeders to these chosen sections should be designed so liberally that on the whole system, in case of the shutdown of one or two stations, a considerable proportion of the load could be carried on the remaining stations through these tie lines. The sections to be chosen for ties depend entirely upon local conditions, but in general those upon which the continuity of service is most important should be selected, for if one station is shut down or one feeder is disabled the cars on the section could still be operated from the other station by means of the second feeder. No general figure can be given which will indicate the per cent of station loads which should be provided for in the capacity of the tie lines, for the addition of these lines to the feeder system should be looked upon as an added investment in the nature of insurance against interruption of service, and a decision as to the proper amount to spend would depend upon the importance attached to the continuity of service.

The calculations of all feeders are, of course, based fundamentally upon Ohm's law, but the writer has found it very convenient, especially in calculating tie lines, to utilize two corollaries which are derived from this fundamental relation. The first of these is that the maximum drop, measured from one end of a uniformly loaded conductor, is one-half the drop produced by an equal total load concentrated at the distant end of the conductor. Or, stated in another way, the maximum drop on a uniformly loaded conductor is equal to the drop produced by the total load concentrated at the center of the conductor. This may be proved readily by reference to Fig. 1, in which  $OR$  represents the resistance of the conductor and  $OI$  the total current in the conductor. If the current at one end is  $I$  and the load diminishes uniformly to zero at the other end of the conductor, then the line  $IR$  is the current curve for a uniformly distributed load. For the same total load concentrated at the distant end  $P$ , the current curve is  $IP$ . The areas included between the current curve and the axes represent in each case the drop over the conductor. For the uniformly distributed load this area is  $\frac{IR}{2}$ , and for the concentrated load it is  $IR$ .

The second corollary has to do with the similarity between moments in a mechanical system and drops in an electrical system. For example, a beam supported at both ends and having on it a certain distribution of load will be in equilibrium when the sum of the moments about any point is zero. Similarly if a conductor has current fed into it from both ends to supply any distribution of load upon it there will be for every distribution some point of division on the conductor through

which no current flows. This is the point of maximum drop and of equal drop from both ends. The system may then be said to be in equilibrium.

In an electrical system we have current, resistance and drop corresponding, respectively, with load, distance and moment of the mechanical system. If the conductor is of uniform size throughout its length, as is usually the case in tie lines, we may use length of conductor instead of resistance.

Based upon these principles we may calculate in detail some typical sections. In the illustrations given, the two sections are assumed to be operating at the same voltage, and the trolley sections are considered to be uniformly loaded and the feeders of uniform size. If these assumptions should not be true in any case, simple modifications in the method would properly provide for the difference.

In the case of an isolated section which is fed from one station only, such as is shown in Fig. 2, the calculation is very simple. The section  $AB$  of length  $L$  feet has a uniformly distributed load of  $I$  amperes, which is considered as concentrated at the center of the section. If  $r$  is the resistance per foot of feeder, the drop from the power station to the nearer end of the section is  $rDI$ . The added drop to the end of the section is  $\frac{1}{2}rLI$  if the feeder is continued undiminished in size to the end of the section, and the total drop is given by the equation

$$E = r \left( D + \frac{L}{2} \right) I$$

If the feeder is reduced in size as the load decreases the maximum drop at the end of the section will be somewhat greater than that given. As an illustration we have:

Load on section is  $I = 750$  amp.

Length of section  $L = 4000$  ft.

Distance from station to section is  $D = 1000$  ft.

Size of cable used is 1,000,000 circ. mil, whose resistance per foot is  $r = 0.00001056$  ohm.

Hence the drop to the end  $A$  of the section is

$$\begin{aligned} E &= r \left( D + \frac{L}{2} \right) I \\ &= 0.00001056 \left( 1000 + \frac{4000}{2} \right) 750 \\ &= 23.7 \text{ volts} \end{aligned} \quad (1)$$

The calculation of a tie section is a little more complex. Take, for example, the simplest case, illustrated in Fig. 3, in which the main feeder between stations is assumed to extend the entire length of the section and to be uniform in size. The section  $AB$  has a uniformly distributed load of total value  $I$  amp, of which  $I_1$  amp are assumed to come from station  $S_1$  and  $I_2$  amp from  $S_2$ .  $P$  is the point of division of load between the stations and is the point of maximum drop on the feeder. We are usually concerned in knowing the load on each station and the maximum drop on the section.

To determine the load  $I_1$  on station  $S_1$  take moments about  $S_2$ . These moments must be so chosen that they will involve only the one unknown, the value of which is sought; otherwise the solution of simultaneous equations becomes necessary and much needless labor is introduced. In this case assume the total load to be concentrated at the center of the section. Then its moment about  $S_2$  would be

$$\left( D_2 + \frac{L}{2} \right) I$$

The moment of the load  $I_1$  at  $S_1$  which would just balance this moment, about  $S_2$ , is

$$(D_1 + L + D_2) I_1$$

Equating and solving we get the load on  $S_1$  equal to

$$I_1 = \left( \frac{D_2 + \frac{L}{2}}{D_1 + L + D_2} \right) I \quad (2)$$

which shows that the load on one station is equal to the total section load multiplied by a fraction whose numerator is the distance from the second station to the center of the trolley section, and whose denominator is the distance between the stations.

The following data are from an actual case:

Load on section is  $I = 1050$  amp.  
 Length of section is  $L = 4670$  ft.  
 Distance to station  $S_1$  is  $D_1 = 5170$  ft.  
 Distance to station  $S_2$  is  $D_2 = 4320$  ft.  
 Size of cable, 1,000,000 circ. mil.  
 The current on station  $S_1$  is then, by equation (2)

$$I_1 = \frac{4320 + \frac{4670}{2}}{5170 + 4670 + 4320} 1050 + 494 \text{ amp.}$$

Load on station  $S_2$  is then  
 $I_2 = I - I_1 = 1050 - 494 = 556$  amp.

The location of the point  $P$  of division of load is readily determined. Since the load is uniformly distributed along  $AB$  we get

$$L_1 = \frac{I_1}{I} L \tag{3}$$

We then have numerically

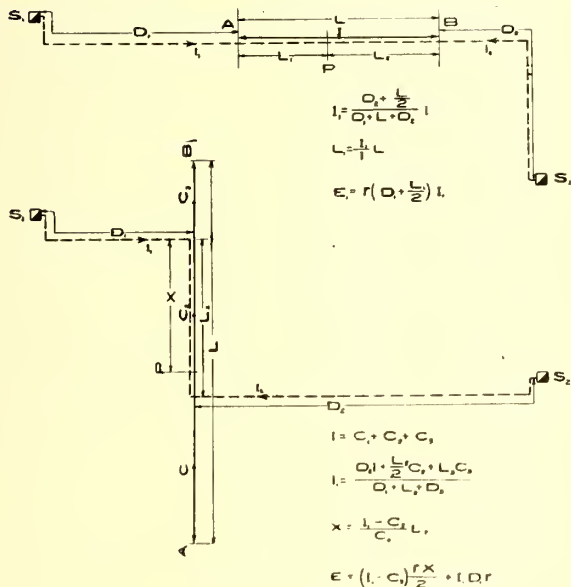
$$L_1 = \frac{494}{1050} \times 4670 = 2185 \text{ ft.}$$

that is, at 2185 ft. from the end  $A$  of the section each power station delivers current. If the load distribution changes, then this point of division shifts, and may be determined for each distribution.

The maximum drop on the section occurs at  $P$ , and it is the same from both stations. We have its value as in equation (1)

$$\begin{aligned} E_1 &= r \left( D_1 + \frac{L_1}{2} \right) I_1 \\ &= 0.00001056 \left( 5170 + \frac{2185}{2} \right) 494 \\ &= 32.6 \text{ volts.} \end{aligned} \tag{4}$$

A second type of tie section is one in which the main feeder between stations does not parallel the trolley section, through-



Figs. 2, 3 and 4

out its length, as shown in Fig. 4. The loads on the three parts of the trolley section are  $C_1$ ,  $C_2$ , and  $C_3$ . We then have the total load

$$I = C_1 + C_2 + C_3 \tag{5}$$

To find the load on  $S_1$  we take moments as before, about  $S_2$ , which gives

$$C_1 D_2 + C_2 \left( D_2 + \frac{L_2}{2} \right) + C_3 (D_2 + L_2) = I_1 (D_1 + L_2 + D_2)$$

Multiplying out and factoring we get

$$(C_1 + C_2 + C_3) D_2 + C_2 \frac{L_2}{2} + C_3 L_2 = I_1 (D_1 + L_2 + D_2)$$

which by substituting from (5) gives

$$I D_2 + C_2 \frac{L_2}{2} + C_3 L_2 = I_1 (D_1 + L_2 + D_2)$$

and hence

$$I_1 = \frac{I D_2 + C_2 \frac{L_2}{2} + C_3 L_2}{D_1 + L_2 + D_2} \tag{6}$$

The load distributed over the distance  $x$  is  $I_1 - C_3$ , and since the distribution is uniform, we have

$$x = \frac{I_1 - C_3}{C_2} L_2 \tag{7}$$

The drop from  $S_1$  to the point of division  $P$  is then as shown in equation (1)

$$E_1 = (I_1 - C_3) \frac{rx}{2} + I_1 D_1 r \tag{8}$$

which is the maximum drop on the feeder, but which may be exceeded at the ends  $A$  and  $B$  of the trolley section.

For a particular case we have:

Load on section is  $I = 750$  amp.

Length of section is  $L = 6740$  ft. divided into lengths of 3400 ft., 1970 ft. and 1370 ft.

The load per foot of section =  $\frac{750}{6740} = 0.1114$  amp.

Hence  $C_1 = 3400 \times 0.1114 = 378$  amp.

$C_2 = 1970 \times 0.1114 = 220$  amp.

$C_3 = 1370 \times 0.1114 = 152$  amp.

Length of section parallel to feeder is  $L_2 = 1970$  ft.

Distance from section to  $S_1$  is  $D_1 = 5170$  ft.

Distance from section to  $S_2$  is  $D_2 = 7440$  ft.

Substituting these values in equation (6) gives

$$I_1 = \frac{750 \times 7440 + 220 \times \frac{1970}{2} + 152 \times 1970}{5170 + 1970 + 7440} = 418 \text{ amp}$$

$$I_2 = I - I_1 = 750 - 418 = 332 \text{ amp.}$$

The point of division between stations is located from equation (7)

$$x = \frac{418 - 152}{220} \times 1970 = 2380 \text{ ft.}$$

Since this distance is greater than the length  $L_2$ , and since the load  $C_1$  is greater than the load on station  $S_2$ , it will be seen that  $C_1$  is divided between  $S_1$  and  $S_2$ . Hence the point of maximum drop on the feeder is at the end of  $L_2$ , where the cable leaves the section. In this case the drop is simply

$$\begin{aligned} E_1 = E_2 &= I_2 D_2 r \\ &= 332 \times 7440 \times 0.00001056 \\ &= 25.1 \text{ volts.} \end{aligned}$$

If the point  $P$  should fall within the length  $L_2$ , then the drop to  $P$  is determined from equation (8).

The method as given here has been found to be very satisfactory in practice. The results are obtained without any "cut-and-try" process and by a little familiarity with the method it is possible to work quite rapidly. The final results show those facts which it is usually necessary to know—viz., the division of load between stations and the maximum drop on the cable.

An electric locomotive has been built in Germany which is propelled by two 35-hp motors supplied with current from 408 Edison storage-battery cells. The battery has a capacity of 280 amp-hours and a discharge pressure of 502 volts. Each cell weighs about 30 lb. and consists of nickel-iron electrodes immersed in a solution of caustic potash. The locomotive has been tested with a 36-ton train as a trailing load and has run 132.5 miles before the battery voltage dropped to 468 volts. The life of the battery is estimated at 18,750 miles.

## COMMUNICATION

### HEATING AND VENTILATION

NEW YORK, Dec. 21, 1909.

To the Editors:

With a large part of the letter of W. R. McKeen, Jr., on the ventilation and heating of cars, in your issue of Dec. 18, no one can disagree, but in regard to one point there must certainly be a difference of opinion. Why should fresh air be taken in near the floor, there to pass over and come in contact with shoes, rubbers, wet skirts, and the general accumulation of dirt on the floor; become laden with germs and foul odors, and then rise to the breathing level, ready to deliver whatever of a disease-breeding nature it may have gathered, to the delicate membrane of the nose and throat and the lungs?

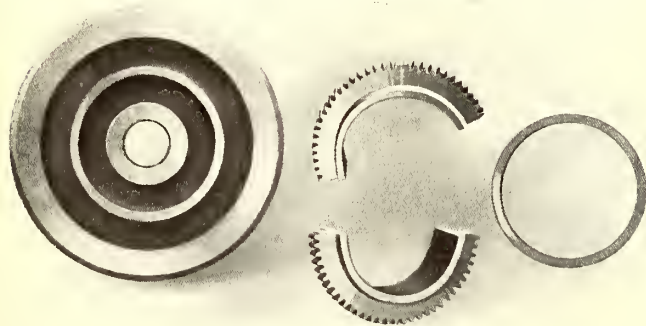
The more reasonable method seems to be to take in the fresh air near the roof and exhaust the foul air near the floor. To do this the old-fashioned and practically worse-than-useless deck should be done away with and the roof made air tight except for the openings where air is to be admitted. From these openings it should be passed over the heaters, from which it must, of course, rise, at least a short distance, into the body of the car.

In the case of street cars it might be found advisable to place the heaters under the seats and allow the warm air to escape from the window pockets back of the seats, where most of the complaints of low temperature arise. The fresh air could then be taken in on a level with the heaters through either the side or end panels. The only difficulty in such a system would be that many passengers will not be satisfied that a car is properly ventilated unless they can see an opening direct to the outer air.

WILLIAM C. WHISTON.

### NEW METHOD OF GEAR MOUNTING

J. E. Osmer, master mechanic, Northwestern Elevated Railroad, Chicago, has recently obtained patents on a new method for mounting gears used in electric railway car propulsion. The noteworthy feature of the new method is the supplanting of the ordinary solid or split gear wheel with a pressed circular rack which is supported on an annular ring projecting inwardly from the web of one of the car wheels, as illustrated. This form of construction will permit the motor-axle bearing on the pinion end to extend inside of the gear, where it will be in direct line with the gear and pinion. Placing the

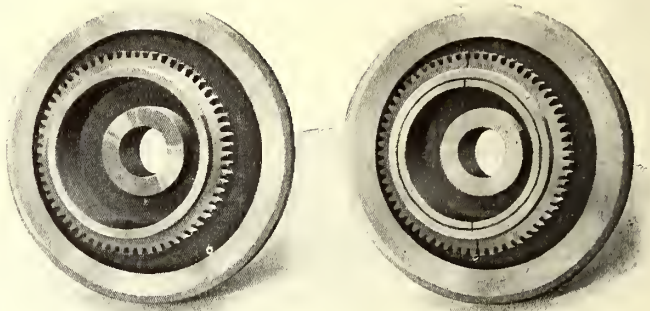


New Gear Mounting—Parts of Sectional Rack

motor-axle bearing in direct line with the transmission of the torque makes possible a more rigid form of construction, which should afford longer life for the gears and bearings.

Two methods of gear mounting are proposed; one with a solid rack and the other with a segmental rack. The circular rack used in both constructions is hydraulically pressed, then machined and treated, with a view to increasing the life over that which can be obtained from a cast-steel gear. In either type of construction the rack is carried on an annular extension welded to the web of the car wheel. This method of at-

tachment is stated to be equally efficient with iron and cast-steel wheel centers, if tires are used, or with the pressed and rolled wheels now in use on many electric roads. The Oxy-acetylene or Oxy-hydric welding processes are both available for mounting the annular extension on wheels, and it is stated that arrangements shortly will be made with wheel manufacturers so that wheels may be purchased with the annular extension welded on. In the type of construction using the solid rack the interior of the rack is machined to the proper size for shrinking solidly upon the annular extension after the rack



New Gear Mounting—Application of Solid and Sectional Cut Racks

has been heated sufficiently. This shrinking fit is all the fastening necessary. With the solid rack type of construction the car wheel must be removed from the axle when the rack is to be renewed. In the type of construction using the sectional rack the interior of the rack is machined to a slip fit with the annular extension. The sections of the rack are bolted to the annular extension, and, if desired, an outer end ring may be shrunk on a flange formed on the motor side of the rack. This double method of securing the rack is recommended for use only with very heavy duty motors, such as might be required in locomotive use. Keys are not required in either type of construction. With the divided rack, it is neither necessary to remove the axle from the truck nor the wheel from the axle when renewing the gear.

An important feature of this method of mounting the circular rack is that the torque from the motor is transmitted first entirely to one wheel and then half through the axle to the opposite wheel. With the usual gear mounting the entire torque is transmitted from the gear direct to the axle and then divided. This practice requires a larger axle to transmit the stress and to provide metal for a key way. Motors of the present type can be used with gears constructed and mounted in the new way. It will be preferable with new motor equipments to have an extended axle-bearing lining cap with an extended lining housing made integral with the magnet frame; thus furnishing a longer bearing at the pinion end of the armature where the torque is applied. With motors having axle bearings designed for the ordinary mounting the new method of gear mounting can be used with the present axle-bearing lining by bolting a split cast-iron sleeve around the axle to arrest the lateral thrust between the motor-axle bearing and the wheel hub.

This new type of construction requires a much smaller gearcase, and the amount of gear compound required is thus reduced. The gearcase designed for this mounting is a U-shaped band enclosing the teeth of the circular rack and pinion.

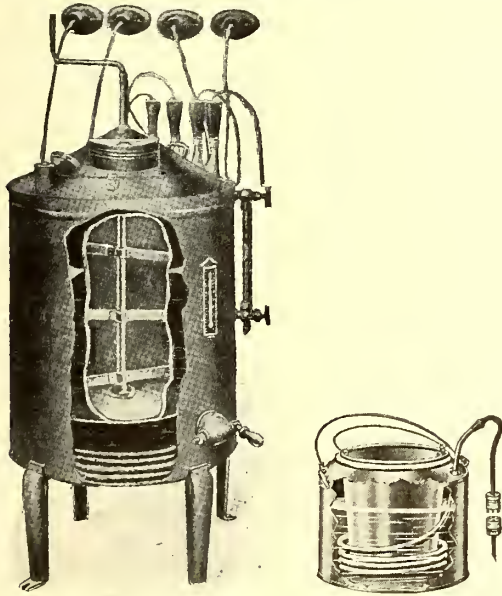
Mr. Osmer states that the new type of gear mounting will effect a saving in weight and will cost less than the ordinary gear wheel pressed or keyed to the axle. The saving will result from a reduction in material and the time required for application of gears. Additional saving will be brought about in the cost of material for axles and gearcases, because they can be made smaller; in the cost of gears, because they will wear longer, and in gear compound, because less will be required. A reduction in current should follow the lessening of the weight of the parts and the placing of the motor-axle bearing

in the direct line of the applied torque. The chief feature of economy is, of course, brought about by the reduction in the first and renewal cost of the circular rack as compared with a gear wheel.

**ELECTRIC GLUE HEATER**

The Advance Machinery Company, Toledo, Ohio, has recently brought out the electric glue heater illustrated, which is intended to provide a neat, quick and economical method for dissolving glue. The maker asserts that it is possible to dissolve the glue in 30 minutes, and that the current may be switched off after 45 minutes or reduced, as the operator may desire.

The heater is made entirely of copper and brass, and the construction is such that when the glue is brought to the proper temperature in the morning the heater may be switched out of circuit, as the heat-retaining jacket serves to maintain a temperature of about 150 deg. for from four to five hours. The glue is first put in soaking buckets, and after it has ab-

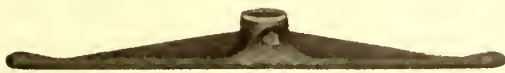


Electric Glue Heater

sorbed all the water necessary and acquired a jelly-like consistency it is put into the glue receptacle. The latter is cylindrical in form, and is surrounded by a jacket filled with water. This water jacket is within an additional copper jacket. The wall between the outside jacket and the water jacket is filled with mineral wool. The water in the jacket is heated by electric coils provided with three-way switches or several sockets, according to the size of the heater. The heaters are made as small as 1 pint or as large as 100 gal.

**CLINCH TROLLEY WIRE EARS**

The accompanying engravings illustrate two types of trolley wire ears made by the Indianapolis Brass Company, Indianapolis, Ind. They are typical of a complete line of ears for all standard sections of trolley wire. The plain ear for round wire has a groove of sufficient depth to allow it to be formed



Clinch Ear for Round Wire

nearly around the wire so as to support it rigidly while leaving the under side of the wire unobstructed as a running surface for the trolley wheel. These ears are made in 12-in. and 15-in. lengths with 5/8-in. or 3/4-in. stud bolts to take from 0 to 0000 round wire. They can be tinned for soldering if desired. The

splicing ear illustrated is intended to be used where splices are to be made at a hanger and it is made to take either a 5/8-in. or 3/4-in. stud bolt. The trolley wire is securely fastened in the ear by set screws and the under or running surface of the wire and ear is perfectly smooth. These splicing ears are made

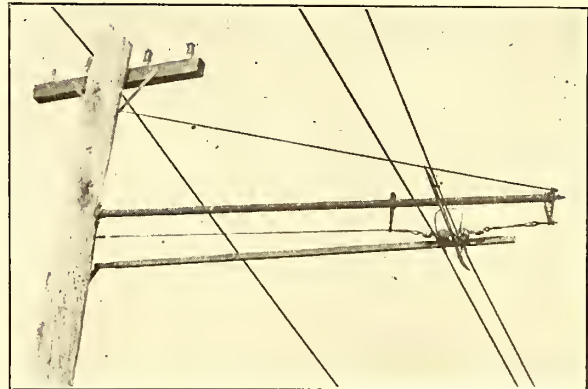


Clinch Splicing Ear

to take the same size and section of wire at both ends or in any combination of sizes and sections. The ear illustrated is designed to take Fig. 8 section wire at both ends. The metal of which these ears are made is claimed to have excellent wearing qualities and high tensile strength.

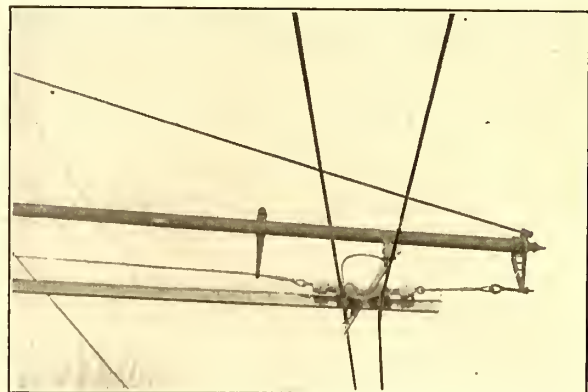
**AUTOMATIC OVERHEAD SWITCH**

The Indianapolis & Louisville Traction Company, which operates the first 1200-volt d.c. railway in this country, has recently equipped its line with a novel automatic trolley switch. The purpose of this switch is to change the trolley from the main wire to the siding wire when the track switch is thrown for the siding. It consists essentially of a switch blade about 4 ft. long tapered at both ends. One end is pivoted to the siding trolley wire and works under the wire. The free end



Overhead Switch Open for Main Line Track

is moved to and from the main line trolley wire by a simple system of bell cranks and rods. When the track switch is set for the main line, the trolley is absolutely free from any extra attachments or obstructions and the highest speed can be main-



Overhead Switch Closed for Siding Track

tained in passing it without any damage to the trolley wheel or liability of throwing the wheel from the wire. Although much sleet has fallen during the last few weeks, it had no effect on the switch operation. This switch was designed by H. D. Murdock, superintendent of the company.

## ORGANIZATION OF THE ACKLEY BRAKE COMPANY

Griffin S. Ackley, formerly president and general manager of the National Brake Company, Inc., Buffalo, N. Y., retired from the management of that company on Jan. 1. He has sold his entire holdings of stock, constituting a controlling interest, to a syndicate of capitalists. Mr. Ackley organized the National Brake Company over six years ago and was its president and general manager until the date of his retirement. Under his able management the company built up a very large business with Peacock & Ackley adjustable brakes throughout the world. The Ackley adjustable brake was put on the market less than a year ago. It is Mr. Ackley's own invention, and has been patented in more than 20 countries. It has already been introduced on over 200 street railways, many of which are in Europe, where sales agencies have been established in London, Berlin, Brussels, Paris and Zurich. The National Brake Company has purchased from Mr. Ackley all the United States, Canadian and Mexican patents on the Ackley adjustable brake and will continue to have the exclusive right to sell these brakes on the North American Continent. Mr. Ackley in turn has acquired from the National Brake Company all of the export business and good will in the Peacock and Tiger brakes in addition to the Ackley brake. He is still the sole owner of the patents on the last-named brake for all countries except the United States, Canada and Mexico. He will, however, have the sole right to sell all of the different types named throughout the world outside of the North American countries noted under the name of the Ackley Brake Company. The new company's headquarters will be in the Hudson Terminal Buildings, New York City, and additional foreign agencies will be established by it in countries where the company has no representatives. Mr. Ackley is now preparing his itinerary for a trip around the world in the interest of the new company. For the present the National Brake Company will manufacture the brakes for Mr. Ackley under contract for export, and has already received one order for 1270 Ackley brakes from the new company.

## QUESTIONS AND ANSWERS UNDER STEAM ROAD INTERSTATE CLASSIFICATION

Circular No. 12c in the Accounting Series issued by the Bureau of Statistics and Accounts of the Interstate Commerce Commission contains answers to important questions relative to the several classifications for steam roads, issued by the commission. Several of the cases, although pertaining to the steam railroad classifications, are of interest to electric lines. These cases are as follows:

Case 433. Query. We have a power house furnishing current for propulsion of electric locomotives and cars, and also for heating, lighting and other purposes in connection with the operation of a steam railroad. It is now proposed to sell current generated in the same power house to a local street railway company. To what account should the revenue derived from the sale of power be credited? Should not a proportion of the expenses of operating the power plant be charged to the appropriate accounts; and, if so, through what clearing account should the charges be handled? In connection with the power plant we desire permission to use the account "operating power plants" solely as a clearing account, and to charge originally all expenditures into that account and then clear the account by charging the various accounts benefited, setting up an account to be called "electric traction" to represent the current furnished for moving trains.

Answer. Authority cannot be given for the opening of an account to be called "electric traction," for the reason that there is an account for that purpose entitled "operating power plants" already prescribed in the classification of operating expenses. In view of the statement that "It is now proposed to sell current generated in the same power house to a local street railway company," the operation clearly becomes an outside operation,

and the entire revenues and expenses of such operations should be set up in full in the outside operations accounts, as provided in the classification of such accounts. The cost of current used by the railroad company should be cleared through the outside operating account, "other operations Cr." and the amount so cleared should be distributed to appropriate accounts in the classification of operating expenses for steam roads. The revenue derived from the sale of power to outside parties will, of course, remain credited to the revenue account of the outside operation, the net revenue of which will be carried direct to income accounts as provided for under "electric light and power plants" in the classification of revenues and expenses for outside operations.

Case 495. Query. A contract with an electric line permits it to operate its cars over our track, for which privilege it pays us 10 cents per car. We are to bear all the expense of maintaining the track. What account should be credited with the amount received from the electric company?

Answer. If the electric line is part of a steam road, or is a carrier using the classifications for steam roads, the revenue should be apportioned to the proper joint-facility rent account under income. If, however, the electric line is not a common carrier reporting to the commission, or is a common carrier using the classifications provided for electric railways, the amount received should be credited to revenue account No. 18, "rent of buildings and other property."

## THE MID-WINTER CONVENTION

Arrangements are being completed at the office of the American Street & Interurban Railway Association for the mid-winter convention of the association to be held Jan. 28. The preliminary announcement of the convention and the notices in regard to it which were sent to member companies have received a most favorable reception, and it is the general verdict that the meeting will be most profitable both to the association and to those who attend. The formal notices in regard to the convention will be sent out from the office of the association this week and will contain a list of the speakers with the titles of the subjects which they will discuss. The meetings will be held in one of the assembly rooms at the headquarters of the railway association, 29 West Thirty-ninth Street, New York City.

The mid-winter meetings of the various committees, as announced, will be held on Jan. 27 and the conference proper on Jan. 28. The meetings will conclude with a dinner which will be extended to the association by the Manufacturers' Association. This dinner will be held at the Knickerbocker Hotel on the evening of Monday, Jan. 28, at 7 o'clock. All street railway officials who are present at the conference will be invited to be present at the banquet.

## MEETING OF THE COMMITTEE ON THE TRANSPORTATION OF UNITED STATES MAIL

A meeting of the committee on the transportation of United States mail of the American Street & Interurban Railway Association was held at the office of the association on Jan. 5. Those present included Robert S. Goff, vice-president and general manager of the Boston & Northern Street Railway, Boston, Mass.; C. H. Hile, assistant to the vice-president, Boston Elevated Railway, Boston, Mass., and Col. A. R. Piper, general freight agent of the Brooklyn Rapid Transit Company, Brooklyn, N. Y. Upon invitation, John H. Pardee, secretary of the Street Railway Association of the State of New York, and Edgar S. Fassett, general manager of the United Traction Company of Albany, N. Y., were present.

Mr. Fassett was appointed a committee of one to draw up a form of inquiry to be sent to different railway companies throughout the country to learn the conditions on each road so far as this matter was concerned.

# News of Electric Railways

## Meeting of Central Electric Railway Association

The annual meeting of the Central Electric Railway Association will be held on Jan. 27, 1910, in the assembly room of the Great Southern Hotel, Columbus, Ohio. The program of the meeting follows:

### MORNING SESSION, JAN. 27, 1910

9:30 a. m.—Business session and reports of special committees.

10:00 a. m.—“Notes on Street Paving,” by Thomas B. McMath, Indianapolis Traction & Terminal Company, Indianapolis, Ind.

10:45 a. m.—“The Daily Inspection and Up-Keep of Rolling Stock,” by H. H. Buckman, master mechanic of the Louisville & Northern Railway & Lighting Company, New Albany, Ind.

11:30 a. m.—Adjournment for lunch.

### AFTERNOON SESSION

1:00 p. m.—“The Railroad Commission and Its Relation to Interurban Roads,” by O. P. Gothlin, of the Railroad Commission of Ohio.

1:45 p. m.—“The Method of Procedure When a Person Refuses to Pay Fare for Self or Child,” by C. C. Williams, ex-Judge of the Common Pleas Court of Columbus, Ohio.

2:30 p. m.—Reports of standing committees: Insurance, Henry N. Staats, chairman; lightning arresters, W. E. Rolston, chairman; publicity, George S. Davis, chairman; standardization, T. W. Shelton, chairman; supply men, John F. Ohmer, chairman; traffic, W. S. Whitney, chairman; personal injury claims, E. C. Carpenter, chairman; transportation, T. F. Grover, chairman; vigilance and membership, C. D. Emmons, chairman.

3:30 p. m.—Annual report of secretary.

3:45 p. m.—Annual address of the president.

4:15 p. m.—Election of officers.

## Cleveland Traction Situation

Charles S. Horner, who has been mentioned as president pro tem of the new City Council at Cleveland, stated a few days ago that if Mayor Baehr did not object, the date of the referendum vote on the street railway franchise would be fixed for April 1, 1910.

The retiring Council, always loyal to Mayor Johnson, took no action at its last meeting regarding the date for the vote. Traction matters were barely mentioned at the meeting, barring the adoption of a resolution to the effect that all communications received by city officials from the street railway should be made matters of record. These communications have been in the hands of Newton D. Baker, city solicitor, but will now become official papers.

On Dec. 29, 1909, the stockholders of the Forest City Railway were notified that an effort would be made to centralize the stock of the Cleveland Railway to protect their interests at the annual meeting on Jan. 26, 1910, and proxies were asked in favor of D. C. Westenhaver, Fred C. Alber or a third party to be designated by each shareholder. The letter sent these stockholders called attention to the provision Judge Tayler made for the guarantee made on their stock by Mayor Johnson and the Municipal Traction Company, and was signed by Fred C. Alber. A year ago animus was shown at the annual meeting of the stockholders of the Cleveland Railway, the former holders of stock of the Forest City Railway feeling that they would not receive fair treatment. All opposition was withdrawn, however, on the appointment of S. T. Everett to represent them on the board.

Mayor Johnson has announced that he will leave the city for five weeks immediately following the close of his term of office for the purpose of taking a vacation in some place where he will be free to enjoy himself untrammelled, and has said that he has no intention of retiring from public life in Cleveland. He advised that those retiring from office aid their successors in every way possible.

## United States Supreme Court Holds Minneapolis Reduced Fare Ordinance Invalid

In an opinion by Justice Day, the Supreme Court of the United States on Jan. 3, 1910, held invalid the ordinance adopted by the City Council of Minneapolis in 1907, requiring the Minneapolis Street Railway Company to sell six tickets for 25 cents. The company contended that the ordinance was a violation of the contract implied in its charter, which, issued in 1873, was to run for 50 years and authorized a charge of 5 cents for each ride. The United States Circuit Court for the District of Minnesota declared against the ordinance, and Justice Day's decision sustained that finding, but with modifications. In the course of his opinion Justice Day said:

“We think that the requirement of the ordinance that the company should operate its roads by the sale of six tickets for a quarter, as required by the ordinance, was an enactment by legislative authority which impaired the obligation of the contract thus held, and owned by the complainant company. We therefore reach the conclusion that the decree of the Circuit Court enjoining the execution of the ordinance should be affirmed.”

## Wheel-Guard Order in Brooklyn

The Public Service Commission of the First District of New York has issued an order to the street railways operating in Brooklyn regarding the use of wheel guards which it has concluded as follows:

“1. That Coney Island & Gravesend Railway, Sea Beach Railway and South Brooklyn Railway, on or before Feb. 1, 1910, equip all cars with wheel guards of a type or types to be approved by the commission, and shall not thereafter operate any cars unless equipped with such wheel guards in a good operating condition.

“2. That Coney Island & Brooklyn Railroad and Brooklyn, Queens County & Suburban Railroad equip all cars with wheel guards, of a type or types to be approved by the commission, at the rate of not fewer than 20 cars a month, beginning Feb. 1, 1910, until all of their cars shall have been so equipped and shall not thereafter operate any cars unless equipped with such wheel guards in a good operating condition.

“3. That Nassau Electric Railroad equip all cars operated by it with wheel guards of a type or types to be approved by the commission at the rate of not fewer than 60 cars a month, beginning Feb. 1, 1910, until all of its cars shall have been so equipped and shall not thereafter operate any cars unless equipped with such wheel guards in a good operating condition.

“4. That the Brooklyn Heights Railroad equip all cars operated by it with wheel guards of a type or types to be approved by the commission at the rate of not fewer than 120 cars a month, beginning Feb. 1, 1910, until all of its cars shall have been so equipped and shall not thereafter operate any cars unless equipped with such wheel guards in a good operating condition.

“5. That as soon as Brooklyn Heights Railroad, or any other companies, shall have equipped cars operated exclusively over the Brooklyn Bridge, or exclusively over the Williamsburg Bridge, with such wheel guards, said company or companies shall be relieved from equipping said cars with fenders.

“6. That as soon as Brooklyn, Queens County & Suburban Railroad, or any of said companies above mentioned, shall have equipped the cars operated exclusively on what is known as the Broadway Shuttle Line, on Broadway between Havemeyer Street and Broadway Ferry, with such wheel guards, they shall be relieved hereby from equipping said cars with fenders.

“7. That as soon as the companies shall have equipped with such wheel guards the cars operated by them on Fulton Street (from Greene Avenue to Tillary Street), Flatbush Avenue (from Fifth Avenue to Fulton Street), Broadway (west of Ralph Avenue), Livingston Street (from Flat-

bush Avenue to Court Street), Washington Street and Adams Street, then said companies shall have the right hereby to fold up fenders on cars when passing over said streets within the limits mentioned and be relieved from equipping with fenders cars operated exclusively over said streets within said limits.

"8. That, except as hereinbefore expressly provided, all cars owned or operated by any of the companies hereinbefore mentioned, when equipped with such wheel guards, shall so carry the fenders that no part thereof shall be less than 10 in. clear above the rails, and that the front edge of the apron shall not be more than 14 in. clear above the rails.

"9. That all of said companies hereinabove mentioned, on or before Jan. 10, 1910, submit to the commission for its approval complete drawings and specifications showing among other things all measurements and the method of attachment to the car of the type or types of wheel guards desired to be used by them in compliance with this order; and it is further

"Ordered, that except as expressly amended by this order, which applies to said companies hereinabove mentioned exclusively, said order of April 28, 1909, as amended by said order of May 14, 1909, shall be and remain in full force and effect; and it is further

"Ordered, that this order shall take effect on Dec. 24, 1909, and shall remain in force until revoked or modified."

#### Transit Affairs in New York

The Public Service Commission has voted to grant the New York Central & Hudson River Railroad an extension of 18 months from Jan. 1, 1910, for depressing the tracks leading to the Grand Central Station and the building of a new terminal.

The Manhattan Bridge Three-Cent Line was incorporated at Albany on Dec. 30, 1909, with a capital stock of \$50,000, to build a railroad from Flatbush Avenue and Fulton Street, Brooklyn, over the Manhattan Bridge and through Canal Street, New York, to the Hudson River. The length of the route is about four miles. The engineering details are all in the hands of John C. Brackenridge. The officers of the company are Frederick W. Rowe, president; John C. Brackenridge, vice-president; Walter Hammit, secretary, and Edward T. Horwill, treasurer.

**Mexican Views.**—The Mexican Tramways Company, Ltd., Mexico City, Mex., has published a handsome album containing 49 views of the buildings and other property of the company and scenes in Mexico City. The album is published in London and a copy has been sent to each stockholder.

**City Superintendent of Street Railways Favored in St. Louis.**—The special joint committee of the Municipal Assembly which has the matter under consideration is said to favor the proposal to create the position of superintendent of street railways under an act of the Municipal Assembly of 1903, the official appointed to that office to supervise street railway service in the interest of the city.

**Bonds Voted for Municipal Line in San Francisco.**—At the election held in San Francisco on Dec. 30, 1909, it was voted to issue \$2,020,000 of bonds to provide funds for equipping the Geary Street, Ocean & Park Railroad with electricity and operating it as a municipal enterprise. This is the third time within five years that the question has been submitted to the voters.

**Public Utility Commissioners Named in Los Angeles.**—In accordance with the decision of the voters of Los Angeles at the recent election that a public utilities commission be created to supervise the operation of the public service corporations doing business in Los Angeles, Mayor Alexander has sent to the City Council for confirmation the names of Meyer Lissner, Frank J. Hart and Paul Haupt as members of the new commission.

**Electrification of Canadian Pacific Railroad at Montreal Denied.**—In reply to a letter addressed by the ELECTRIC RAILWAY JOURNAL to the Canadian Pacific Railroad at Montreal recently in regard to the report that the company contemplated electrifying its lines in and about Montreal, D.

McNicol, vice-president of the company, replied under date of Dec. 28, 1909, as follows: "There is nothing in the reports to which you refer in connection with the proposed electrification of our lines in this vicinity."

**Proceedings of the Arkansas Association.**—The report of the second annual convention of the Arkansas Association of Public Utility Operators held at Hot Springs, Ark., on May 12, 13 and 14, 1909, has been published. It comprises a volume of 104 pages, 6 in. x 9 in., and includes the papers presented at the convention and a verbatim report of the discussion. The papers presented at the meeting which were of interest to electric railway circles and the discussions thereon were published in the ELECTRIC RAILWAY JOURNAL of May 22, 1909, page 940.

**Philadelphia Transit Talks.**—Transit Talk No. 39 of the Philadelphia (Pa.) Rapid Transit Company was dated Dec. 16, 1909. The subject was "Courtesy," and an invitation was extended to the public to co-operate with the company in making for efficiency by reporting all cases of negligence on the part of employees to perform their duties properly and courteously. Talk No. 40 was headed with the question, "Lost Anything?" It contained some facts about the lost-and-found department, and suggested that people who had lost articles write or telephone the lost-and-found department of the company.

**State and County Cannot Both Exact Tax Based on Earnings.**—The claim of the Terre Haute, Indianapolis & Eastern Traction Company, filed some time ago against Wayne County, Ind., has been allowed and certain back taxes, paid to the county in 1907 and 1908, based on the "cash on hand" of the company, have been ordered refunded. The claim was based on a decision of the Supreme Court to the effect that the State Board of Tax Commissioners, in valuing the property of railroads, considered among other things the net earnings of the companies. It was held therefore that any cash that the company might have on hand could not be taxed in addition to the valuation placed by the State on the property as a whole, as this cash represented a part of the net earnings.

**Meeting of Central Railway Club.**—The annual meeting of the Central Railway Club will be held at the Hotel Iroquois, Buffalo, N. Y., on Jan. 13, 1910, at 2 p. m. The feature of the business session will be the annual reports and a paper by W. O. Thompson, master car builder of the Western Division of the New York Central & Hudson River Railroad, his subject being "Car Interchange: Its Past, Present and Future." The annual dinner of the club will be held at 7:30 p. m. It will be preceded by a reception in the main parlor of the Hotel Iroquois. A musical program will be followed by addresses by Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, New York, and second vice-president of the New York Railroad Club, and others. E. M. Tewkesbury, general superintendent of the South Buffalo Railway, and second vice-president of the club, will be toastmaster. The price of dinner tickets has been fixed at \$2 per plate for members and for ladies and \$3 for non-members. Harry D. Vought, 95 Liberty Street, New York, N. Y., is secretary of the club.

**January Meeting of the A. S. M. E. in Boston.**—The meeting of the American Society of Mechanical Engineers. to be held in Boston on Jan. 21, 1910, will take the form of a banquet at the Hotel Somerset to be tendered jointly by the American Society of Mechanical Engineers, the Boston Society of Civil Engineers and the Boston branch of the American Institute of Electrical Engineers, to the presidents of the three societies, George Westinghouse, Geo. B. Francis and L. B. Stillwell, respectively, and other guests, including John Anderson Bensel, the incoming president of the American Society of Civil Engineers. Following the banquet there will be addresses by several of the guests and a paper will be presented on the main and auxiliary machinery of the battleship *North Dakota*, illustrated by lantern slides. The president of the Boston Society of Civil Engineers will also outline what that society has accomplished toward a project that has been under discussion at Boston for a united engineering building to be occupied by the several professional engineering organizations located in Boston and vicinity.



# Financial and Corporate

## New York Stock and Money Market

January 4, 1910.

The stock market to-day was more active than for any day within the past two months and prices showed a distinct disposition to advance, in spite of the fact that call money rates were high. Traction shares, especially Interborough-Metropolitan issues, are strong and active. Third Avenue has advanced to more than 18.

Call money touched 14 per cent yesterday and to-day ranged 6 to 9 per cent. Ninety-day loans were 4½ to 4¾ per cent.

## Other Markets

Philadelphia Rapid Transit Stock has advanced and the majority of the transactions to-day were in the neighborhood of 28. Union Traction has been moderately active.

In the Boston market, the Massachusetts Electric issues have been quite active and the common stock has advanced 2 points during the past week. The preferred is also a trifle stronger. Boston Elevated has advanced.

In Chicago, the various series of the Chicago Railways Company have been active during the week. Series 1 has remained about stationary in price, while Series 2 has advanced several points during the week. There has been some trading in Series 3 and 4.

Bonds of the United Railways, Baltimore City Passenger Railway and of the Fairmont & Clarksburg Traction Company are the only traction securities being traded in Baltimore.

At the weekly auction of securities in New York, \$10,000 5 per cent bonds of the Second Avenue Railroad sold at 65.

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

	Dec. 28.	Jan. 4.
American Railways Company.....	a47¼	a48¼
Aurora, Elgin & Chicago Railroad (common).....	*57	*57
Aurora, Elgin & Chicago Railroad (preferred).....	*92	*92
Boston Elevated Railway.....	132½	136½
Boston & Suburban Electric Companies.....	15	a16
Boston & Suburban Electric Companies (preferred).....	*75	*74
Boston & Worcester Electric Companies (common).....	a12	a11
Boston & Worcester Electric Companies (preferred).....	a48	a48
Brooklyn Rapid Transit Company.....	79½	79½
Brooklyn Rapid Transit Company, 1st pref., conv. 4s.....	86¾	86¾
Capital Traction Company, Washington.....	*133½	a135¼
Chicago City Railway.....	*190	185
Chicago & Oak Park Elevated Railroad (common).....	*2	*2
Chicago & Oak Park Elevated Railroad (preferred).....	*10	*10
Chicago Railways, pteptg., ctf. 1.....	a110	a109
Chicago Railways, pteptg., ctf. 2.....	a33	a35½
Chicago Railways, pteptg., ctf. 3.....	a15	a20
Chicago Railways, pteptg., ctf. 4s.....	*10	a10
Cleveland Railways.....	*84	*84
Consolidated Traction of New Jersey.....	a77¼	a77
Consolidated Traction of New Jersey, 5 per cent bonds.....	a106	a106
Detroit United Railway.....	*65	*65
General Electric Company.....	159½	159¾
Georgia Railway & Electric Company (common).....	102½	a104½
Georgia Railway & Electric Company (preferred).....	*87	*87½
Interborough-Metropolitan Company (common).....	24¾	24¾
Interborough-Metropolitan Company (preferred).....	62	61
Interborough-Metropolitan Company (4½s).....	83¾	83
Kansas City Railway & Light Company (common).....	a33	a35
Kansas City Railway & Light Company (preferred).....	*79	*75
Manhattan Railway.....	*140	*138
Massachusetts Electric Companies (common).....	a16¼	a19
Massachusetts Electric Companies (preferred).....	a79	a80¼
Metropolitan West Side, Chicago (common).....	a19	a19
Metropolitan West Side, Chicago (preferred).....	a57	a57
Metropolitan Street Railway.....	*23	*20
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	*85	83¾
Northwestern Elevated Railroad (common).....	a18	a17½
Northwestern Elevated Railroad (preferred).....	a68	a70
Philadelphia Company, Pittsburg (common).....	a50¾	a51¼
Philadelphia Company, Pittsburg (preferred).....	a45¼	a45¼
Philadelphia Rapid Transit Company.....	a27	a28¾
Philadelphia Traction Company.....	a89	a89
Public Service Corporation, 5 per cent col. notes.....	*106¼	*106¼
Public Service Corporation, ctf. 5.....	*101½	a104
Seattle Electric Company (common).....	a115½	a115
Seattle Electric Company (preferred).....	104	a105
South Side Elevated Railroad (Chicago).....	a56	a56
Third Avenue Railroad, New York.....	16¼	18¾
Toledo Railways & Light Company.....	*95¾	12½
Twin City Rapid Transit, Minneapolis (common).....	116	117
Union Traction Company, Philadelphia.....	a52	a52¾
United Rys. & Electric Company, Baltimore.....	a14¼	a14
United Rys. Inv. Co. (common).....	42¼	41¼
United Rys. Inv. Co. (preferred).....	*71¾	*71¾
Washington Ry. & Electric Company (common).....	*13½	a13½
Washington Ry. & Electric Company (preferred).....	*91½	a91¼
West End Street Railway, Boston (common).....	a95½	a95
West End Street Railway, Boston (preferred).....	*106	*106
Westinghouse Electric & Mfg. Company.....	82¼	82
Westinghouse Elec. & Mfg. Company (1st pref.).....	130	*130

a Asked. \* Last Sale.

## Annual Report of Boston Elevated Railway

Earnings from operation of the Boston Elevated Railway in the year ended Sept. 30, 1909, were \$14,493,853, as compared with \$14,074,697 in the previous year, indicating a gain of 3 per cent. Of the total gross revenue, \$14,024,768 was received from the transportation of passengers. The statement of earnings for the year is as follows:

Earnings from operation.....	\$14,493,853.13
From passengers carried.....	\$14,024,768.39
From carriage of mails.....	37,977.46
From tolls for use of tracks by other companies.....	41,736.60
From rentals of real estate.....	134,401.49
From advertising.....	108,075.00
From interest on deposits, etc.....	138,041.47
From miscellaneous income.....	8,852.72
Total.....	\$14,493,853.13
Operating expenses.....	\$9,488,483.83
For general expenses.....	\$999,284.70
For maintenance of roadway and buildings.....	1,415,477.61
For maintenance of equipment.....	1,042,855.35
For transportation expenses.....	6,030,866.17
Taxes.....	1,063,774.87
West End St. Ry. tax on capital stock and property.....	631,116.26
Boston Elevated Ry. tax on capital stock and property.....	293,487.57
Boston Elevated Ry. compensation tax and tax on income.....	139,171.04
Coupon interest on West End St. Ry. bonds.....	680,180.00
Coupon interest on Boston Elevated Ry. bonds.....	556,000.00
Less interest accrued this year charged to construction account.....	177,091.34
Rentals of leased railways.....	1,346,157.04
Rental of East Boston tunnel.....	53,216.16
Rental of subway.....	\$211,746.17
Less amount collected of Boston & Northern St. Ry.....	24,954.61
Rental of Washington Street tunnel.....	254,923.69
Depreciation fund.....	200,000.00
Dividends paid on capital stock.....	802,503.00
Balance carried to surplus account.....	\$38,914.32

William A. Bancroft, the president, says in his report:

"The various extensions and additions to the company's service mentioned in the last report are being rapidly provided.

"Besides its ordinary taxes the company's contribution to the public during the last fiscal year amounted to at least \$430,573.27, made up as follows:

Compensation tax for the use of streets under the Acts of 1897.....	\$124,171.04
Interest at 4 per cent on \$4,361,025, cost of paving laid in streets by company.....	174,441.00
Cost of maintaining street paving by company.....	63,446.61
Amount of subway rental devoted to sinking fund.....	63,514.62
Moving snow removed from sidewalks and roofs (estimated) not less than.....	5,000.00
Total extraordinary payments to the public.....	\$430,573.27
Add taxes assessed on real estate.....	310,007.90
Add taxes assessed on capital stock and income.....	629,595.93
Total.....	\$1,370,177.10
To the above may be added the balance of subway rental.....	123,276.94
Also the rental of the East Boston tunnel.....	53,216.16
Also the rental of the Washington Street tunnel.....	254,923.69

Grand total, which is about 12.4 per cent of the gross revenue of the company for the year..... \$1,801,593.89

"Concerning the capitalization of the properties owned and leased by this company, your directors wish you to know that the capital stock of the West End Street Railway on Sept. 30, 1909, was as follows:

Preferred.....	\$6,400,000
Common.....	11,120,150
Total.....	\$17,520,150

"Of this capitalization the preferred stock was the amount authorized by the Legislature (Chapter 413, Acts of 1887) for the purchase of the horse railroads which made up the West End system, and was considered only the value of these properties.

"Of the common stock \$7,150,000 was paid in in cash at par, and the balance was sold under orders of the Railroad Commissioners for cash at prices ranging from 40 to 80 per cent in excess of the par value, realizing a premium of \$2,177,237.75.

"Of the \$13,450,100 par value of the stock of the Boston Elevated Railway the first \$10,000,000 was paid in in cash at par, and the balance was sold under orders of the Railroad Commissioners for cash at a price of from 10 to 55 per cent in excess of the par value, realizing a premium of \$1,860,068.13 above the par value. The present capitaliza-

tion of the two companies, therefore, represents an actual payment in cash of \$3,978,017.26 above the par value of the outstanding stock. The amount of this cash premium has been invested in the properties now owned by the companies. So there is not only no capital inflation of these properties, but much more has been paid in than is represented by the par value of the stocks. The dividends paid on the stocks and the interest paid on the bonds of the two companies make an average return to the capital invested of something less than 5.13 per cent per annum. It is not true, therefore, of these properties that 'excessive dividends are paid on watered stock.'

"From the summary of stockholders of record Oct. 1, 1909, it appears that the total number is 3972, holding 134,501 shares of stock. Of these 3505, holding 116,818 shares, live in Massachusetts. In other words, 87 per cent of the stock is held in Massachusetts.

"The total length of surface tracks controlled by the company is now 460.039 miles. This, with the elevated mileage of 24.087 miles, makes a total mileage of 484.126.

"Traffic statistics compare as follows:

	Year ending Sept. 30—		
	1909.	1908.	1907.
Round trips.....	5,549,774	5,571,459	5,606,616
Revenue car-miles, surface.....	43,599,806	43,818,640	44,027,731
Revenue car-miles, elevated.....	7,295,450	7,806,503	7,802,457
Revenue car-miles, U. S. mail cars....	232,425	232,746	231,381
Revenue car-miles, total.....	51,127,681	.....	52,061,569
Total revenue passengers carried.....	281,008,471	273,132,584	271,084,815
Average receipts per passenger.....	\$.04991	\$.04989	\$.04997

**Consolidation of Michigan Companies**

Holdenpyl, Walbridge & Company, New York, N. Y., E. W. Clark & Company, Philadelphia, Pa., and W. A. Foote, Jackson, Mich., announce the organization of the Commonwealth Power, Railway & Light Company, to take over the Commonwealth Power Company, Grand Rapids-Muskegon Power Company, Saginaw-Bay City Railway & Light Company, Grand Rapids Railway, Michigan Light Company, Flint Electric Company, Flint Gas Company, Cadillac Water & Light Company, Charlotte Electric Company, Shiawassee Light & Power Company and the Au Sable River Property and Rights. These companies own the electric light and power properties in Grand Rapids, Saginaw, Bay City, Kalamazoo, Battle Creek, Jackson, Flint, Pontiac, Cadillac and a number of intermediate towns, the electric railways in Grand Rapids, Saginaw and Bay City and between Saginaw and Bay City, the gas properties in Kalamazoo, Jackson, Pontiac, Saginaw, Bay City and Flint and developed and undeveloped powers on the Muskegon, Kalamazoo, Grand and Au Sable Rivers. The Commonwealth Power, Railway & Light Company is to be capitalized at \$18,000,000, of which \$6,000,000 is to be preferred stock and \$12,000,000 common stock. No bonds are to be issued. The combined earnings of the consolidated companies for the calendar year ended Dec. 31, 1909, November and December being estimated, follow:

Gross earnings.....	\$4,487,177
Operating expenses.....	2,317,561
Net earnings from operation.....	\$2,169,616
Less taxes and interest on \$16,677,000 outstanding bonds of constituent companies.....	1,049,373
Surplus earnings.....	\$1,120,243
Less dividends on \$6,894,000 preferred stock of constituent companies in the hands of the public.....	398,640
Balance available to the Commonwealth Power, Railway & Light Company.....	\$721,603
Dividend on \$6,000,000 Commonwealth Power, Railway & Light Company 8 per cent preferred stock.....	360,000
Balance .....	\$361,603

**Consolidation of Chicago South Side Surface Railways**

An official statement regarding the Chicago City & Connecting Railways says that the property of the Chicago City Railway, Southern Street Railway, Calumet & South Chicago Railway and the Hammond, Whiting & East Chicago Electric Railway as a whole is to be taken over on a 4 per cent basis—that is, after payment of interest upon rehabilitation bonds and the city's percentage of earnings, the net earnings for 1910 upon the bonds and shares of stock deposited will be approximately \$2,550,000, which is 4 per cent upon \$62,000,000. This capitalization will consist of \$22,000,000 5 per cent first lien bonds, which are the only

securities that will be offered to the public at this time. Instead of issuing the \$25,000,000 preferred and \$15,000,000 common stock at first proposed, there will be issued participation certificates, which, while without any face value, will be entitled to certain percentages of the earnings over and above the fixed charges. The plan for the issuance of these certificates is only partially matured, but it is practically agreed that they will be two classes, and the division of the earnings will be 4½ per cent for the first class, after which the second class will receive 4 per cent. After this the two classes divide the earnings up to 6 per cent, which is the limit allowed for the first class. It is presumed, but not so stated, that the division of these certificates will be in the same proportion as the first plan proposed to divide the stock issue between preferred and common.

The bonds will be dated Jan. 1, 1910, and will mature Jan. 1, 1927. They will be secured by deposit with trustees of the following securities: \$16,971,900 of stock of the Chicago City Railway, valued at 200; \$5,000,000 of bonds of the Calumet & South Chicago Railway; \$1,635,000 of 5 per cent bonds and \$800,000 of stock of the Southern Street Railway; \$1,000,000 of first mortgage 5 per cent bonds of the Hammond, Whiting & East Chicago Electric Railway not yet issued, and \$1,000,000 common stock of this company not yet issued. The securities comprise all the bonds and stocks of the Southern Street Railway and of the Hammond, Whiting & East Chicago Electric Railway. The provision of deposit will include caring for the debts of the underlying properties, other than those incurred for completion and rehabilitation. A sinking fund is provided after the third year which will result in the retirement of \$3,000,000 of the bonds before maturity. The earnings of the combined properties are about 2 1/3 times the interest requirements of the bonds. It is stated that the bonds are underwritten and partly sold. The unsold portion will be offered by J. P. Morgan & Company, the Illinois Trust Company and the First Trust & Savings Bank.

**Forty-second Street, Manhattanville & St. Nicholas Avenue Railway, New York, N. Y.**—The sale of the property of the Forty-second Street, Manhattanville & St. Nicholas Avenue Railway under foreclosure of the \$1,600,000 second mortgage has been postponed until March 1, 1910. The amount found to be due for principal and interest is \$1,676,933.

**Lake Shore Electric Railway, Cleveland, Ohio.**—The annual meeting of the Lake Shore Electric Railway will be held on Jan. 25, 1910. The company has outstanding \$3,000,000 of 5 per cent cumulative preferred stock on which no dividends have been paid, the accumulations on which aggregate \$1,626,000, and, with the outstanding capital, make a total capitalization of about \$4,626,000. A plan for refinancing will be considered at the meeting. It has been roughly estimated that a holder of 100 shares of the present preferred stock should receive 33 1/3 shares of new 6 per cent cumulative stock and 66 2/3 shares of non-cumulative preferred stock. The holders of the preferred stock issued in October, 1901, will probably be given some advantage over the holders of stock issued in 1903, however, as the accumulations on the stock issued in 1901 are greater than those on the stock issued in 1903.

**Public Service Corporation, Newark, N. J.**—In a letter addressed recently to J. P. Morgan & Company, of New York, N. Y., in connection with the sale of \$8,000,000 of general mortgage 5 per cent bonds, President Thomas N. McCarter stated the gross earnings of the system controlled by the corporation, including miscellaneous income, as follows: Year 1905, \$19,909,843; 1906, \$21,498,826; 1907, \$23,628,044; 1908, \$24,267,687; nine months ended Sept. 30, 1909, \$19,286,261. The increase in gross revenue for the first nine months of 1909 over the corresponding period of 1908 was \$1,654,204. During the 12 months ended Sept. 30, 1909, gross earnings, including miscellaneous income, were \$25,921,892 and operating expenses, taxes, rentals and fixed charges of leased and controlled properties were \$23,235,533.

**Tacoma Railway & Power Company, Tacoma, Wash.**—Stone & Webster, Boston, Mass., say that they know of no foundation for the report that the Union Pacific Railroad is negotiating for the purchase of the property of the Tacoma Railway & Power Company.

# Traffic and Transportation

## Increase in Fares in Wisconsin

The Wisconsin Electric Railway, Oshkosh, Wis., and the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., have announced a general increase in the fares on the electric railways which they control, effective on Jan. 15, 1910. Briefly, the new schedule increases the fare on the Oshkosh-Neenah line 5 cents, the Oshkosh-Omro line 5 cents and the Oshkosh-Fond du Lac line 10 cents, making the new Oshkosh-Neenah fare 25 cents, the Oshkosh-Omro fare 20 cents and the Oshkosh-Fond du Lac fare 35 cents. On Jan. 15 a straight 5-cent fare will be charged on all city lines, except between 6 a. m. and 7 a. m. and 6 p. m. and 7 p. m., when workingmen's tickets will be honored. The statement of the company to the public, dated on Dec. 16, 1909, was signed by J. P. Pulliam, manager of the railway department, and approved by Clement C. Smith, president, and R. T. Gunn, general manager. It follows:

"We are this day giving public notice to the patrons of our lines that on Jan. 15, 1910, a new schedule of fares will be put into effect. While the fares to certain points on the interurban lines will be lowered, the fares in general will be raised. We have reached the determination to raise these fares with great reluctance, because it is our purpose to furnish transportation as cheaply as it can be furnished; but we would find it impossible to operate the lines on the present basis.

"The fare from Oshkosh to Neenah is now at an average rate of 1.28 cents per mile; the fare from Oshkosh to Fond du Lac at an average of 1.37 cents per mile, and the fare from Oshkosh to Omro at an average of 1.35 cents per mile. Our records show that all of these fares were entirely too low, even at the time they were first put into effect. It was then hoped by the management in putting these low fares into effect that travel might be stimulated to such an extent that the low fares would be justified. Such has not been the case, although every effort has been made to increase the earnings and decrease the operating expenses.

"The necessity for increasing the fares became evident to the management of the Winnebago Traction Company in the spring of 1905, and the company at that time raised the fares from Oshkosh to Neenah from 20 cents to 25 cents, and from Oshkosh to Omro from 15 cents to 20 cents. The company's records show there was a considerable increase in earnings, and they also show the number of passengers carried did not decrease.

"In March, 1908, following the panic of 1907, which reduced all travel materially, the receiver of the Winnebago Traction Company sought to build up earnings again by reducing the interurban fares to the rates charged formerly. There was an immediate decrease in gross earnings, and this decrease has continued to the present time. From this experience, it appears the public was satisfied with the increase of rates in 1905, and it was shown conclusively that increasing the rates did not decrease the number of passengers carried and lowering the rates did not increase the number of passengers carried.

"The former bondholders of the Winnebago Traction Company still own the greater part of the bonds of the Wisconsin Electric Railway. They have suffered a heavy loss through the reduction in the amount of bonds on the property. The present management represents these old interests as well as the interest of those who made new investments.

"The present management of the two properties was therefore fully aware of former conditions when it took charge of the properties. It was hoped, however, by reducing the bonded debt, by bringing the two properties under the same management, by centralizing the work of repairs and maintenance of cars, by through operation of interurban cars from Fond du Lac through Oshkosh to Neenah, and by other economies due to one management, the increase in rates might possibly be avoided. The management of the two companies was combined in August, 1908, and every effort has been made to take advantage

of the economies of joint operation. This joint operation has been in force for nearly a year and a half, and since Jan. 1, 1909, all of the books, accounts and records of the companies have been kept in accordance with the new accounting system prescribed by law. The results of operation have now been so clearly shown that there is no excuse for the management to postpone an effort to obtain sufficient revenue to give good service and maintain the property as it should be maintained.

"The United States Supreme Court in the Knoxville Water Works case, decided Jan. 4, 1909 (see page 13, United States Supreme Court Reports, Volume 212), held:

"'Before coming to the question of profit at all the company is entitled to earn a sufficient sum annually to provide not only for current repairs, but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of the earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning. It is not only the right of the company to make such provision, but it is its duty to its bond and stockholders, and in case of a public service corporation at least, its plain duty to the public. If a different course were pursued the only method of providing for replacement of property which has ceased to be useful would be the investment of new capital and the issue of new bonds or stocks. This course would lead to a constantly increasing variance between present value and bond and stock capitalization—a tendency which would inevitably lead to disaster either to the stockholders or to the public, or to both.'

"The earnings of the companies have so far been entirely inadequate to provide for depreciation, and the management cannot longer neglect what has been prescribed by the Supreme Court of the United States to be 'its plain duty.'

"During the last few years there has been a steady increase in the price of everything going into railway construction and operation. Our taxes have been doubled, and other public burdens have fallen heavily on the companies.

"The wages of the conductors and motormen have not been increased for several years. The cost of living has increased, and, while our trainmen have been patient and have not made any request for increase in wages, we feel it is only due them to give them such advance as the companies can afford on account of increased rates, and we are putting this increase in wages into effect beginning Dec. 1, 1909.

"It is common thought among persons not familiar with the operation of electric railways that electric railways ought to carry passengers for less fare than steam railroads. This idea originated in the early days of electric interurban railways, when the managements of the companies were unable to forecast the future and expected that lower rates would stimulate business to such an extent that low rates would be justified, but they have been disappointed. At that time steam railroads were receiving 3 cents per mile. The fare permitted by law is now 2 cents per mile. The greater part of the earnings of steam railways comes from freight traffic, while the freight traffic of electric railways in Wisconsin is so small that it is a question whether or not the expense of carrying it does not consume the earnings from that source.

"While the laws of Wisconsin permit railroad fare of 2 cents per mile, our new schedule does not reach that average fare. On a 2-cent basis the fare from Fond du Lac to Oshkosh would be 40 cents instead of 35 cents; the fare from Oshkosh to Neenah would be 30 cents instead of 25 cents, and the fare from Oshkosh to Omro would be 25 cents instead of 20 cents, as established by the new schedule. The management is striving to obtain the necessary income without raising the rates to the limit fixed by law.

"No one has a deeper interest in the growth and prosperity of the communities served by the Wisconsin Electric Railway and the Eastern Wisconsin Railway & Light Company than the companies themselves. Individuals and

manufacturing plants may move from one community to another, but a public service company must continue to furnish the best service in its power. We earnestly desire and solicit the goodwill and friendship of all who do business with us, and we feel the public will respect us more if we establish our properties on a sound financial basis than if we allow them to run down and depreciate and plainly neglect what the highest court in the land has declared a duty to the public.

"In conclusion, we desire to say that the rates established by the new schedules are fully justified by the valuation of the property made by the Wisconsin Tax Commission for taxation purposes, and do not depend upon nor are they made necessary by any unfortunate financial operations or litigation in the past. The books of the companies will be open to the public for inspection at any reasonable time, and their examination will convince any of our patrons who care to see them that not only is the increase in rate well warranted now, but should have been made long ago."

#### Promotions from City to Interurban Service and Increase in Wages by Ft. Wayne & Wabash Valley Company

The following bulletin announcing the plans of the Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind., to advance its employees from city to interurban service, signed by F. Hardy, superintendent of transportation, and approved by C. D. Emmons, general manager, was issued under date of Dec. 24, 1909:

"Beginning Jan. 1, 1910, and until further notice, interurban trainmen as far as possible will be taken from the ranks of employees on city lines under the following rules and regulations:

"1. Only men between the ages of 25 and 40 will be promoted.

"2. City men between the ages of 25 and 40 desiring opportunity on interurban line will apply to F. I. Hardy, superintendent of transportation; until and including Jan. 10, 1910, applications will be considered according to seniority of men in city service. After Jan. 10, 1910, applications will be considered in order of time application is made.

"3. Men promoted must learn interurban work on their own time.

"4. City men before being permitted to work on interurban cars must pass a physical examination for which a fee of \$1 is charged, and before being turned in as extra men must pass examination on interurban rules.

"5. City men working extra on interurban line will retain their positions on city lines until they have a regular run on the interurban.

"6. City men working extra on the interurban will be expected to move to another city for regular interurban run if open run is not out of the city in which he lives.

"7. City divisions will carry the following number of extra interurban men: Ft. Wayne, 8; Wabash, 1; Peru, 1; Logansport, 3; Lafayette, 4.

"8. City men promoted to interurban will begin on interurban at same rate of pay that city standing entitles them to, and will then be increased according to interurban wage scale. A man promoted to interurban drawing 19 cents per hour will draw 19 cents until the completion of 19-cent year, after which he will draw 20 cents for the next year's service, etc., until he draws maximum scale.

"9. Merit and demerit records of city men transferred to the interurban will be kept on the city division until such time as men are promoted to interurban for regular run, when their records will be transferred to interurban division with exact standing as on city line.

"10. Beginning Jan. 1, 1910, freight, local, work train and limited runs will be classed at same rate of pay.

"11. Beginning Jan. 1, 1910, new men employed on interurban line or men taken from cities where no employees' deposit is required will be required to make a deposit of \$20."

At the time of the posting of the bulletin regarding conditions of service on the interurban and the city lines, the company also announced the following scale of wages for motormen and conductors, effective on Jan. 1, 1910:

Lafayette city division: First year, 17 cents per hour; second year, 18 cents per hour; third year, 19 cents per hour;

fourth year, 19 cents per hour; fifth year and thereafter, 20 cents per hour.

Logansport city division: First year, 17 cents per hour; second year, 18 cents per hour; third year, 19 cents per hour; fourth year, 19 cents per hour; fifth year and thereafter, 20 cents per hour.

Peru city division: First year, 17 cents per hour; second year, 18 cents per hour; third year and thereafter, 19 cents per hour.

Wabash city division: First year, 17 cents per hour; second year, 18 cents per hour; third year and thereafter, 19 cents per hour.

Ft. Wayne city division: First year, 18 cents per hour; second year, 19 cents per hour; third year, 20 cents per hour; fourth year, 20 cents per hour; fifth year and thereafter, 21 cents per hour.

Interurban division: First year, 18 cents per hour; second year, 19 cents per hour; third year, 20 cents per hour; fourth year, 21 cents per hour; fifth year, 22 cents per hour; sixth year, 23 cents per hour; seventh year, 24 cents per hour; eighth year and thereafter, 25 cents per hour.

#### Increase in Wages in New Jersey

The announcement of the increase in the wages of the employees of the Public Service Railway, made on Dec. 28, 1909, was addressed to the motormen and conductors, and was signed by Thomas N. McCarter, president of the company. It follows:

"It is a genuine pleasure for me to be able to announce to you at this Christmas season that the company, after long deliberation, has settled upon a new scale of wages, effective Jan. 1, 1910, which will be of great benefit to you all. The new scale is as follows: First-year men, 21 cents per hour; second-year men, 22 cents per hour; third-year men, 23 cents per hour; tenth-year men, 24 cents per hour.

"1911. First-year men, 22 cents per hour; second-year men, 23 cents per hour; third-year men, 24 cents per hour; tenth-year men, 24½ cents per hour.

"1912. First-year men, 23 cents per hour; second-year men, 24 cents per hour; third-year men and upward, 25 cents per hour.

"In addition to the foregoing, the company has also decided upon the two following additional propositions:

"First: An extra time allowance will be made to such men as volunteer for an additional trip after their day's work is finished.

"Second: All men on the extra list who answer all roll calls, and perform the work assigned to them, for a period of a week, will be guaranteed a minimum wage of \$10.50 per week.

"I believe that this places the wage scale of this company upon the most satisfactory basis of any similarly situated corporation in this part of the country, and I rejoice that the company's increased prosperity, to which you have all contributed, makes this action possible.

"The company also has under consideration the adoption of a benevolent plan for the benefit of its employees, which we hope to perfect during the coming year.

"Of course, it is manifest that the consummation of this benevolent plan, and the carrying into effect of the raises outlined for future years, can only take place if we continue to have the same loyalty and co-operation on the part of employees which we have had in the past."

#### Pension Plan and New Terms of Service in Philadelphia

On Jan. 1, 1910, the Philadelphia (Pa.) Rapid Transit Company announced in a Transit Talk in the daily press new conditions to govern the service of employees with the company. The greeting to the employees follows:

"At a special meeting of the directors of the Philadelphia Rapid Transit Company, held on Dec. 31, 1909, to consider the welfare of the employees of the company, it was determined:

##### I. INSURANCE

"To provide for an insurance of \$500 for each employee in the transportation (motormen and conductors), shop, power house and lines and cables departments—not including officers or clerks. This provision is to take effect im-

mediately with respect to men now in the employ of the company; but with respect to men employed after Jan. 1, 1910, it is not to take effect until they have been in the continuous employ of the company for two years.

#### II. PENSIONS

"To provide for pensions of \$20 a month to all employees who have arrived at 65 years of age and have been continuously in the service of the company and its subsidiary companies for 25 years.

#### III. INCREASED WAGES, JULY 1, 1910

"The motormen and conductors now in the employ of the company, and who remain continuously therein, will receive an increase of 1 cent an hour on July 1, 1910; another cent an hour on July 1, 1912, and another cent an hour on July 1, 1914, making a maximum rate at that date of 25 cents per hour.

"Motormen and conductors entering the service after Jan. 1, 1910, will receive the present rate of wages, namely, 22 cents an hour, until they have served the company continuously for two years, and if they remain in the service of the company, they will then receive the increase of 1 cent an hour each two years thereafter, until the maximum of 25 cents an hour is reached.

#### IV. FOR ELEVATED EMPLOYEES

"Motormen and conductors in the elevated service will likewise receive an increase of 1 cent an hour on July 1, 1910, and further increases of 1 cent an hour at the end of each 2-year period, until the maximums of 28 cents an hour for motormen and 25 cents an hour for conductors are reached.

"New men entering the elevated service will be likewise increased after each two years of continuous service.

"Station and train men now in the elevated service will receive 19 cents an hour after July 1, 1910, with a further increase to 20 cents at the expiration of two years.

"New employees entering this branch of the service will receive 18½ cents an hour until they complete two years of service, when they will be paid 19 cents, and after two years' further service, 20 cents.

"Arrangements will be made to give the benefit of the above insurance and pension features to certain employees of the roadway department.

"A committee of the officials of the company has been instructed by the board of directors to work out the details of the insurance and pension plans."

**Limited Cars Collide in Indiana.**—The eastbound Dayton limited and the westbound Newcastle limited of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., were telescoped in a head-on collision at Willett's Switch, 3 miles west of Greenfield, at 3:30 p. m. on Jan. 1, 1910. Five passengers were seriously injured and several were slightly hurt.

**The Question of Car Temperature in Cincinnati.**—An indictment has been returned by the Hamilton County Grand Jury against W. Kesley Schoepf, president of the Cincinnati Traction Company, on the charge of failure to keep the temperature in certain street cars up to the required 60 deg. Fahr. The indictment states that on Dec. 20, 1909, the temperature in cars on four lines was found to be insufficient.

**New Los Angeles-Pacific Timetable.**—The Los Angeles-Pacific Company, Los Angeles, Cal., has published a new timetable of its suburban and interurban service, a feature of which is a condensed statement of the running time between various points over the several routes. Special attention is called to the "Balloon Route Excursion," a trip of 100 miles for \$1 through picturesque lower California, which includes a ride of 36 miles along the ocean shore.

**Long-Distance Service in Ohio.**—The Ohio Electric Railway has established service between Columbus and Toledo, with a change of cars at Lima. The trains run by way of Springfield and Lima, 187 miles distant, and the schedule time is 5 hr. 15 min. Two trains each way are operated daily. The service was established primarily for the accommodation of members of the General Assembly. The company operates a similar service between Columbus and Indianapolis and Cincinnati and Indianapolis.

**Conductors Traffic in Car Tickets in Columbus, Ohio.**—Two conductors in the employ of the Columbus Railway &

Light Company, Columbus, Ohio, were fined \$50 each on Dec. 31, 1909, for illegally retaining and selling used tickets of the company. They sold tickets which they had failed to punch and ring up at the rate of 40 for \$1. One of the men convicted had been in the employ of the company for 16 years. He is said to have confessed that he had been stealing tickets for the last five or six years. The other conductor had been with the company only a year.

**Boston Elevated Railway Distributes Rewards.**—The Boston (Mass.) Elevated Railway made its seventh annual distribution of rewards to employees on Dec. 31, 1909, about \$75,000 in gold being given to 3500 men in the transportation service whose records were satisfactory for the year. Between 80 per cent and 90 per cent of the employees in each of the company's 10 divisions were eligible for the reward, which varied from a minimum of \$20 to a maximum of \$25. Last year the minimum was \$15. Since inaugurating the custom of giving a bonus in gold to employees with exemplary records at New Year's the company has distributed \$403,785 to men in various branches of its service.

**Toledo, Bowling Green & Southern Traction Company Accepts Tariffs.**—The Toledo, Bowling Green & Southern Traction Company has issued the following notice: "The Toledo, Bowling Green & Southern Traction Company hereby adopts, ratifies and makes its own, in every respect as if the same had been originally filed and posted by it, all tariffs, rules, notices, concurrences, traffic agreements, divisions, authorities, power of attorney, or other instruments whatsoever filed with the Interstate Commerce Commission or Railroad Commission of Ohio, by the Toledo Urban & Interurban Railway, Harry W. Lloyd, receiver, prior to Jan. 1, 1910, the beginning of its possession. By this tariff it also adopts and ratifies all supplements or amendments to any of the above tariffs, etc., which it has heretofore filed with the commission."

**Conference on Weymouth Trolley Freight Situation.**—The members of the Railroad Commission of Massachusetts conferred with the officers of the Old Colony Street Railway and the Selectmen of Weymouth on Dec. 21, 1909, relative to the franchise offered by the town to the company in connection with the carrying of freight and express matter. Bentley W. Warren, of Boston, represented the company, and Town Solicitor Worthen the selectmen. Mr. Warren stated that the Old Colony Street Railway had secured franchises to carry freight in 26 municipalities and was now operating such a service in 22 cities and towns. The company objected to the franchise offered in Weymouth on account of its being limited to 20 years, and contended that the commission should grant it an unlimited franchise. Chairman Hall of the commission informed the Selectmen that under the laws the commission possessed the right to change the regulations at any time, but that it was doubtful if the commission had authority to approve such a franchise with a time limit. He felt that if the Weymouth charter was allowed it would enable a municipality to grant or withhold franchise rights independently of the State authorities.

**Injunction to Increase in Fare Denied.**—Judge Swearingen has handed down an opinion in the suit brought in the Borough of Turtle Creek against the Electric Avenue Street Railway, the Ardmore Street Railway, the Consolidated Traction and the Pittsburgh Railways, refusing to grant an injunction to prevent the latter, as lessee, from operating cars over the borough streets or to charge a fare of 10 cents from the east line of Turtle Creek to Pittsburgh. It was alleged by borough officials that the original franchise provided that the Ardmore Street Railway should haul passengers over its own lines, those of the Electric Avenue Street Railway and the Consolidated Traction Company from Turtle Creek to Pittsburgh for a maximum fare of 10 cents. The Pittsburgh Railway afterward leased the lines and raised the fare to 15 cents between the points, and it was alleged it had no right to charge this rate nor to use the tracks of the company running into Turtle Creek without the consent of the borough officials. An injunction was asked. Judge Swearingen held that the company was under no obligations to carry passengers from Wilkinsburg for 5 cents, and thence to Pittsburgh for another 5 cents. The court further held that the fare of 15 cents for the trip was not proved excessive.

## Personal Mention

**Mr. H. M. Dowling** has resigned as a member of the Railroad Commission of Indiana.

**Mr. J. C. Forester** has resigned as general freight agent of the Ohio Electric Railway, Cincinnati, Ohio.

**Mr. Frank E. Payne** has been appointed a member of the Railroad Commission of Indiana to succeed Mr. H. M. Dowling, resigned.

**Mr. J. R. Harrigan**, superintendent of the Columbus, Delaware & Marion Railway, Columbus, Ohio, has been appointed general manager of the company.

**Mr. C. O. Sullivan**, traffic manager of the Winona Interurban Railway, Winona Lake, Ind., has been appointed general freight and passenger agent of the company.

**Mr. R. T. Gunn** has resigned as vice-president and general manager of the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., and of the Wisconsin Electric Railway, Oshkosh, Wis., on account of ill health.

**Mr. O. S. Newton** has resigned as chief engineer of the Mansfield Railway, Light & Power Company, Mansfield, Ohio, to become electrical engineer of the Buckeye Mining & Smelting Company, with properties at Big Pine, Col.

**Mr. G. A. Harvey** has resigned as electrical engineer of the International Traction Company, Buffalo, N. Y., after serving six years in that capacity and has gone to Colorado Springs, Cal., for a short respite before taking up work in the Central West.

**Mr. John F. Lahrmer**, chief train dispatcher of the Columbus, Delaware & Marion Railway, Columbus, Ohio, has been appointed superintendent of the company, to succeed Mr. J. R. Harrigan, who has been appointed general manager of the company.

**Mr. E. G. Howard** has resigned as general superintendent of the Pensacola (Fla.) Electric Company, which furnishes power for lighting in Pensacola and operates 20.5 miles of electric railway in that city. Mr. Howard has not yet announced his plans for the future.

**Mr. Clement C. Smith**, president of the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., and the Wisconsin Electric Railway, Oshkosh, Wis., has assumed the duties of manager of the companies, relinquished by Mr. R. T. Gunn, whose resignation is announced elsewhere in this column.

**Mr. W. S. Bourlier** has been appointed electrical engineer of the Washington, Baltimore & Annapolis Electric Railway, with headquarters at Odenton, Md., in charge of rolling stock and the power department of the company. Mr. Bourlier was formerly with the construction department of the General Electric Company.

**Mr. J. P. Pulliam**, general superintendent of the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., and the Wisconsin Electric Railway, Oshkosh, Wis., has been appointed manager of the railway department and assistant general manager of the companies in charge in the absence of Mr. Clement C. Smith.

**Mr. W. J. Kelsh**, master mechanic of the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., and the Wisconsin Electric Railway, Oshkosh, Wis., has been appointed superintendent of rolling stock of both companies and assistant manager of the railway department of the Eastern Wisconsin Railway & Light Company, with headquarters in Oshkosh, Wis.

**Mr. M. B. Osborne** has recently been appointed master mechanic of the Galveston (Tex.) Electric Company. Mr. Osborne has been a shop employee of the company for several years, and his appointment as master mechanic is in recognition of his seniority, attention to the interests of the company and his capabilities, in accordance with the policy of the company to advance men in its service.

**Mr. J. H. Brinkerhoff** has resigned as superintendent of the Rio Grande Junction Railway, Grand Junction, Col., to become general superintendent of the Grand Junction & Grand River Valley Railway, Grand Junction, Col. Mr. Brinkerhoff has been in steam railroad service continuously

since 1891. For 15 years he was connected with the Union Pacific Railway and for the last 3½ years he has been connected with the Rio Grande Junction Railway as superintendent.

**Mr. John C. Brackenridge**, formerly chief engineer of the Brooklyn (N. Y.) Rapid Transit Company, has been elected vice-president of the Manhattan Bridge Three-Cent Line, which has been incorporated with the intended purpose of building a 4-mile railway from Brooklyn across the Manhattan Bridge, which is soon to be opened, into New York. Mr. Brackenridge served as commissioner of public works under Mr. Martin W. Littleton, president of the Borough of Brooklyn, several years ago, and has recently been acting in an independent consulting capacity with offices in New York.

**Mr. John A. Jones**, city engineer of Lewiston, Maine, has been appointed a member of the Railroad Commission of Maine to succeed Mr. Parker A. Spofford, Bucksport, whose term of office expired on Nov. 24, 1909. Mr. Jones is a native of Lewiston and was graduated from Bates College in 1872. While in college, he was engaged in the Bangor and Piscataquis survey and has been in railroad work practically ever since. In 1874, Mr. Jones was elected city engineer of Lewiston, a position he has held under different administrations. Mr. Jones helped to build the horse railway in Lewiston and has laid out more than 400 miles of electric railway, including the Lewiston, Bath & Brunswick Street Railway and the Lewiston, Augusta & Waterville Street Railway.

**Mr. E. Keller**, for the last three years foreman of inspection of the eastern division of the elevated lines of the Brooklyn (N. Y.) Rapid Transit Company, has resigned from that company to become connected with the engineering department of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. Mr. Keller entered the employ of the Brooklyn Rapid Transit Company in May, 1897, as a stock clerk and was advanced rapidly through the mechanical department. In June, 1899, he was appointed wireman's helper and continued in this capacity until January, 1900, when he was appointed road inspector. In February, 1903, Mr. Keller was appointed wireman and on Feb. 22, 1905, he was appointed controller man. On Nov. 23, 1906, he was appointed assistant foreman of the eastern division of the elevated lines and was advanced from this position to that of foreman on May 31, 1907. During his connection with the Brooklyn Rapid Transit Company, Mr. Keller took the evening course in applied electricity at Pratt Institute, Brooklyn.

**Mr. F. E. Reidhead**, whose retirement as manager of the Paducah (Ky.) Traction Company to return to the home office of the Stone & Webster Management Association in Boston was announced in the *ELECTRIC RAILWAY JOURNAL* of Jan. 1, 1910, is a graduate engineer and has been in the employ of Stone & Webster since 1897. During his connection with Stone & Webster Mr. Reidhead has served as general superintendent of the Minneapolis (Minn.) General Electric Company, manager of the Columbus Railroad, Columbus Power Company and Gas Light Company of Columbus, Columbus, Ga., and for two years as manager of the Paducah Traction Company and the Paducah Light & Power Company. Mr. Reidhead made many friends in Paducah, and the *News-Democrat* of that city upon learning that Mr. Reidhead was to leave Paducah published an editorial complimenting him on the results he achieved which it concluded as follows: "Under Mr. Reidhead's management we understand the company's interests in Paducah have arrived at a very satisfactory degree of development and this should in itself be a measure of great satisfaction to both the retiring manager as well as those interested in the company."

**Mr. A. B. Wells** has been appointed superintendent of the local lines of the Pacific Electric Railway, Los Angeles, Cal., in Pasadena and vicinity and the Mt. Lowe division of the company, with offices in Pasadena. Mr. Wells began his railway career with the Brooklyn (N. Y.) Rapid Transit Company in 1896 as a clerk. His service with this company continued until 1904, during which time he acted as chief clerk to the dockmaster in charge of track supplies, general timekeeper of the maintenance of way department, chief clerk to the chief engineer, assistant chief clerk to the

general manager and payroll accountant in charge of the time of the whole system. Mr. Wells resigned from the Brooklyn Rapid Transit Company to accept a position as operating superintendent with the Mexico City Tramway, Mexico City, Mex., and remained with the company two years, during which he had charge of all the divisions of the company at different times. Shortly after leaving Mexico Mr. Wells became chief clerk to Mr. Joseph McMillan, general manager of the Pacific Electric Railway, and continued in this position until his appointment as superintendent of the lines of the company in Pasadena and the Mt. Lowe division on Dec. 15, 1909.

**Mr. W. F. Towne**, who, as noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 25, 1909, page 1284, has been given the title of general freight agent of the Pacific Electric Railway, Los Angeles, Cal., has been engaged in railroad work for 20 years. Mr. Towne started as a telegrapher and stenographer in Massachusetts. Subsequently he filled several representative traffic positions with steam railroads in the East and later served as commercial agent of the Colorado & Southern Railroad and the Denver & Rio Grande Railroad in Colorado. Mr. Towne next became foreign freight agent of the Southern Pacific Company, San Francisco, and later accepted the position of auditor of the Tonopah (Nev.) Railroad. He has been connected with the Pacific Electric Railway, Los Angeles, Cal., which operates more than 550 miles of line, since Jan 1, 1908.



W. F. Towne

**Mr. M. W. Glover** has been appointed auditor of the Mobile Light & Railroad Company, Mobile, Ala., to succeed Mr. Lloyd Lyon, who as announced in the *ELECTRIC RAILWAY JOURNAL* of Dec. 11, 1909, has been appointed treasurer of the Mexico Tramways and the Mexican Light & Power Company, Ltd., Mexico City, Mex. Mr. Glover relinquished the position of assistant to the traffic manager of the Illinois Traction System to accept the appointment to the Mobile Light & Railroad Company. He was formerly auditor of the Ohio Electric Railway, in which capacity he served from July 1, 1906, until Oct. 31, 1909. Mr. Glover began his railroad career on Dec. 1, 1889, in the local freight office of the Southern Carolina Railway, which at that time was in the hands of a receiver. He was subsequently transferred to the auditor's office where he handled freight, passenger and other accounts. The Southern Carolina & Georgia Railroad succeeded to the property of the Southern Carolina Railway and the receivership was terminated prior to July, 1895, when Mr. Glover was appointed traveling auditor of the Southern Carolina & Georgia Railroad. In May, 1899, the Southern Carolina & Georgia Railroad was absorbed by the Southern Railway. Mr. Glover was retained as traveling auditor by the Southern Railway and continued in that capacity until June, 1901, when he was advanced to chief traveling auditor of the Southern Railway. In June, 1903, he resigned from the Southern Railway to become chief clerk to the auditor of the Atlanta & West Point Railroad and the Western Railway of Alabama and continued with that company until July 1, 1906, when he accepted the position of auditor of the lines comprising the Ohio Electric Railway. Mr. Glover has been president of the Central Electric Accounting Conference since the formation of the organization in 1907.

#### OBITUARY

**James W. Friend**, Pittsburgh, Pa., died on Dec. 26, 1909, after a lingering illness. He was 64 years old. Mr. Friend was vice-president of the Pressed Steel Car Company, the Western Steel Car & Foundry Company, one of the owners of the Clinton Iron & Steel Company, vice-president of the German National Bank, Allegheny, and a director in the Farmers Deposit National Bank, Pittsburgh. The funeral took place on Dec. 29, 1909.

## Construction News

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

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

#### RECENT INCORPORATIONS

**San José (Cal.) Railroads.**—Incorporated for the purpose of taking over the San José & Los Gatos Interurban Railway and the San José (Cal.) Railway. It is the intention to construct other lines within the corporate limits of San José, East San José and Santa Clara, as well as in the immediate outskirts of San José. The total length of the system, when extensions are completed, will be 23 miles. Capital stock, \$5,000,000. Incorporators: L. E. Hanchett, W. R. Lawson, E. M. Rea and F. E. Fitzpatrick.

**\*Beech Grove Traction Company, Indianapolis, Ind.**—Incorporated in Indiana for the purpose of building an electric railway from Indianapolis to Beech Grove, also to build and operate power plants. Capital stock, \$10,000. Directors: W. H. Ogan, M. T. Hawkins and S. E. Hamlin.

**\*Somers, Polson & Missoula Electric Railway, Kalispell, Mont.**—Incorporated for the purpose of building an electric railway between Kalispell and Polson, and eventually to make a connection with the Northern Pacific Railroad on the south and with Whitefish and Columbia Falls on the north. Capital stock, \$50,000. Incorporators: J. A. Coram, F. H. Nash, T. D. Long, E. R. Gay and A. L. Jacquit, all of Kalispell; James A. Talbott, Columbia Falls.

**\*Whitefish & Polson Electric Railway, Kalispell, Mont.**—Incorporated to build an electric railway from Kalispell northward to Whitefish and southward through Somers to Polson, on the west shore of Flathead Lake. Headquarters, Kalispell. Capital stock, \$200,000. Incorporators: G. H. Adams, J. H. Stevens, Joseph Edge, D. Ledgerwood, O. P. Mosby and Peter Nilson.

**\*Manhattan Bridge Three-Cent Line, Brooklyn, N. Y.**—Incorporated for the purpose of building a 4-mile street railway from the junction of Flatbush Avenue and Fulton Street, Brooklyn, over the Manhattan Bridge and through Canal Street, Manhattan, to the Hudson River. The engineering details are all in the hands of John C. Brackenridge. The company proposes to charge a 3-cent fare. Principal office, Brooklyn. Capital stock, \$50,000. Officers: Frederick W. Rowe, president; John C. Brackenridge, vice-president; Walter Hammit, secretary; Edward T. Horwill, treasurer.

**\*Niagara Falls, Welland & Dunnville Electric Railway, Welland, Ont.**—Application has been made by this company, through its solicitor Hugh A. Rose, Welland, for a charter to build an electric railway from Niagara Falls to Allenburg, then along the east side of the Welland Canal to Port Robinson, then west by the Forks road to Dunnville. It will be about 50 miles long. Capital stock, \$1,000,000. Directors: J. Cralton Gardner, Niagara Falls, N. Y.; William Maxwell and George H. Bugar, Welland; F. S. Buell, Buffalo, N. Y.; F. R. Lalor, M. P., Dunnville, and George Arnold, Ridgeville.

**\*Sunbury & Freeburg Street Railway, Sunbury, Pa.**—Chartered to build a 15-mile electric railway from Selinsgrove to Freeburg via Kantz. A section of the line in Selinsgrove will be over the right-of-way of the Sunbury & Selinsgrove Electric Railway. Capital stock, \$30,000. Directors: W. H. Lyons, Sunbury, president; Guy Webster, Boyd A. Musser, C. M. Clement and W. H. Greenough.

**Mill Mountain Incline, Inc., Roanoke, Va.**—Chartered to build an electric railway from Roanoke to the summit of Mill Mountain. Preliminary capital stock, \$5,000 to \$20,000. Officers: A. B. Hammond, president; C. Markley, vice-president; O. L. Bottomley, secretary and treasurer, all of Roanoke.

**Oregon & Washington Traction Company, Walla Walla, Wash.**—Incorporated in Oregon to build an electric railway from Walla Walla to Pendleton, Ore., a distance of 53 miles. Principal office, Walla Walla. Capital stock \$500,000. Incorporators: Max Baumcister, E. S. Isaacs, A. H. Reynolds, John Smith, W. A. Ritz, S. L. Sharpstein, Samuel Drumheller and C. K. Holloway. [E. R. J., Nov. 20, '09]

## FRANCHISES

**Alameda, Cal.**—The Southern Pacific Company, San Francisco, has applied to the City Council for a franchise for about 400 ft. of track to extend from the east end loop of the new electric system to the south end of High Street Bridge across the Tidal Canal. It is stated that the company plans to extend its Alameda system to connect with the suburban line projected east of Fruitvale and on to San José.

**Los Angeles, Cal.**—The City Council has granted a franchise to Fred W. Forrester for a street railway on Vermont Avenue from Muth Street to Eighth Street. Property owners have already raised \$12,000 as a bonus to the Los Angeles Railway for the construction of the line. The City Council has also sold a franchise to the Edwards & Wildey Company for a line on Melrose Avenue from Heliotrope Drive to Normandie.

**Cœur d'Alene, Idaho.**—It is stated that the Spokane, Wallace & Interstate Electric Railway will apply for an electric railway franchise at the next meeting of the City Council. Surveys have been completed and options have been obtained on much of the right of way between Cœur d'Alene and Wallace. F. F. Johnson, president. [E. R. J., Jan. 30, '08.]

**\*Twin Falls, Idaho.**—A franchise has been granted to the Twin Falls Electric Railroad, Light & Power Company to establish a street railway in Twin Falls. The company is represented in Twin Falls by George F. Sprague and W. P. Guthrie.

**Auburn, Ill.**—The City Council has granted a franchise to the Illinois Traction Company to construct its system through that city. Service to Springfield in the future will be through Auburn.

**East St. Louis, Ill.**—The City Council has granted an extension of time to the Southern Traction Company of Illinois in which to complete its electric railway between Belleville and East St. Louis. W. E. Trautman, president. [E. R. J., Aug. 21, '09.]

**\*Indianapolis, Ind.**—The Beech Grove Traction Company has applied to the County Commissioners for an electric railway franchise over Churchman Pike between Indianapolis and Beech Grove. A similar franchise has been applied for by the Shore Line Traction Company which proposes to build over the same route.

**St. Joseph, Mo.**—The City Council has passed two ordinances granting franchises to the St. Joseph Railway, Light, Heat & Power Company. One grants a 30-year franchise for an extension of the Frederick Avenue line from Twenty-sixth Street to a point several hundred yards east of State Hospital No. 2. The other ordinance grants a 35-year franchise for a line into Northwest St. Joseph.

**Baker City, Ore.**—The City Council has granted to the Baker Interurban Railway a six-months' extension of its franchise in which to begin work on its street railway in Baker City. The company also plans to build an interurban railway from Baker City to North Powder and Rock Creek. Anthony Mohr, Baker City, treasurer and purchasing agent. [E. R. J., Sept. 11, '09.]

**Donora, Pa.**—The Borough Council has annulled the franchise of the Donora & Eldora Street Railway and has given a contract to put streets in same condition as when the company entered upon them. The railway was recently taken over by the Pittsburgh, McKeesport & Westmoreland Railway.

**Austin, Tex.**—The Austin Electric Railway has made a proposition to the County Commissioners for a 20-year franchise to operate three cars over the Colorado Bridge to serve the people of South Austin, offering to pay an annual rental of \$1,150 for the use of the tracks over the bridge.

## TRACK AND ROADWAY.

**\*Bridgeport Electric & Railway Company, Bridgeport, Ala.**—This company has been organized to build a 5½-mile street railway in Bridgeport. A 250-hp power plant will also be built. Officers: W. D. Scarbrough, president; L. W. Rorer, vice-president; A. L. Atwood, secretary; J. P. Scarbrough, treasurer and manager, all of Bridgeport.

**Troy, Ala.**—Surveys are being made under the direction of W. W. Lotspeich, Atlanta, Ga., for the route for the proposed street railway in Troy. W. R. White is the holder of the franchise. [E. R. J., Aug. 14, '09.]

**California Midland Railroad, San Francisco, Cal.**—John Martin, president of this company, is said to have announced that the line would be completed to Mamonton by spring and Grass Valley in the fall, connecting Grass Valley and Marysville. The route will be changed somewhat from the original plan by taking in Spenceville, Iron Mountain and the Penn Valley country west of Grass Valley. The line as planned will reach Marysville, Grass Valley, Nevada City and Auburn, a distance of 70 miles.

**Atlanta, Ga.**—Louis B. Magid, president of the Piedmont Power Company, Atlanta, denies the report that he is interested in a street railway project at Tullulah Falls. Mr. Magid states, however, that the Piedmont Power Company is about to develop a large water power of 20,000-hp capacity. [E. R. J., Dec. 25, '09.]

**Macon Railway & Light Company, Macon, Ga.**—This company expects to place contracts during the next two months for the construction of 4 miles of new track and overhead work. About 8 miles of track and overhead construction will be rebuilt. J. T. Nyhan, general manager.

**East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill.**—This company expects to start work during the spring on its proposed railway, which is to connect East St. Louis, Dupo, Bixby, Columbia and Waterloo, a distance of 24 miles. Nearly all the rights-of-way have been secured, and steel and other material has been ordered for two overhead crossings near Columbia. Capital stock, authorized and issued \$750,000. Headquarters, Metropolitan Building, East St. Louis. H. Reichenbach, Columbia, secretary and treasurer. [E. R. J., Aug. 7, '09.]

**Belleville & Pinckneyville Traction Company, Pinckneyville, Ill.**—This company has completed the preliminary work and secured all the franchises in connection with its proposed electric railway between Belleville and Pinckneyville, 46.5 miles. Financial matters, however, have not as yet been closed up. The projected line will pass through Freeburg, New Athens, Lenzburg, Marissa, Tilden, Coulterville, Swanwick, and Winkel. Locations for the power plant and repair shop have not as yet been definitely decided upon by the company. Capital stock, authorized, \$100,000. to be increased to \$2,500,000. Bonds, authorized, \$2,500,000. Officers: L. D. Turner, Belleville, president; E. R. Hincke, Pinckneyville, vice-president; George F. Mead, Pinckneyville, secretary; J. A. Hamilton, Marissa, treasurer; Harper Bros., East St. Louis, chief engineers. [S. R. J., May 2, '08.]

**Indianapolis, Crawfordsville & Western Traction Company, Indianapolis, Ind.**—This company will reballast its track from Brownsburg, Ind., to Crawfordsville, Ind., 31 miles, beginning work early this spring. C. E. Morgan, general manager.

**Tippecanoe & Monticello Interurban Company, Monticello, Ind.**—W. R. White, secretary, announces that this company expects to have construction under way on its projected railway in the early spring. The line will connect Monticello, Idaville, Sitka, Buffalo, Hedley, Pulaskiville and Winamac, a distance of 36 miles. The motive power will be either gasoline or electricity. It is planned to operate four cars. Capital stock, authorized, \$100,000. Officers: Wm. R. Felker, president; Thos. W. O'Connor, vice-president and treasurer; W. R. White, secretary and general manager, all of Monticello. [E. R. J., Sept. 11, '09.]

**Des Moines & Sioux City Railroad, Des Moines, Ia.**—A meeting of the directors of this company was recently held to consider a new proposition for financing the proposed electric railway to Sioux City. The board passed a resolution to issue its debentures in the denomination of \$50 to the amount of \$100,000, payable in three years, at 6 per cent interest. This amount is required in the preliminary work of financing the line. [E. R. J., Nov. 20, '09.]

**Marengo & Midland Railway, Marengo, Ia.**—It is reported that the project of building an electric railway from Marengo to Cedar Rapids is being revived by this company. Meetings have been held between representatives of the towns along the route, and the matter is again being taken



up by the Commercial Clubs of the two cities. D. C. Mott and C. M. Breen, Marengo, are interested. [S. R. J., Jan. 16, '07.]

**Kansas Union Traction Company, Altamont, Kan.**—At an election held on Dec. 28, three townships of Labette County voted bonds to aid the Kansas Union Traction Company, making a total of \$31,500 for the three townships. The company proposes to build a 90-mile railway from Coffeyville to Cherryvale. Barney McDaniel, secretary. [E. R. J., Dec. 18, '09.]

**Twin City & Lake Superior Railway, Minneapolis, Minn.**—This company has filed a mortgage in favor of the American Trust & Savings Bank, Chicago, Ill., as trustee, to secure an issue of \$4,000,000 of bonds. Of this amount \$250,000 of bonds is to be issued at once. The company is building a 130-mile electric railway from Minneapolis to Duluth and Superior. About one-half of the route has been graded. [E. R. J., Jan. 1, '10.]

**Interstate Railway, Kansas City, Mo.**—The Electric Traction Construction Company, Commerce Building, Kansas City, Mo., is in the market for electrical machinery, sewer pipe, cement, cars, bridge material, etc., for the Interstate Railway which is now building an electric railway from Kansas City to St. Joseph, Mo., a distance of 48½ miles. [E. R. J., Nov. 20, '09.]

**Kansas Traction Company, Kansas City, Mo.**—This company advises that it has not decided upon a definite date for beginning work on its projected railway. Financial arrangements are pending. The line will be about 200 miles in length and will extend from Kansas City, Mo., to Coffeyville, Kan., via Lawrence, Topeka, Ottawa, Garnett, Iola and Cherryvale, Kan. The third-rail system will be used. Capital stock, authorized, \$25,000. Headquarters, 1631 Penn Avenue, Kansas City, Mo. Officers: F. B. Shirley, Kansas City, Mo., president and general manager; Charles Roszie, Liberty, Kan., vice-president; George W. Boyd, Coffeyville, Kan., secretary; W. C. Hall, Coffeyville, Kan., treasurer; Paul Julien, Indianapolis, Ind., chief engineer. [S. R. J., May 9, '08.]

**Hornell-Bath Interurban Railway, Hornell, N. Y.**—The Public Service Commission of the Second District has authorized this company to issue \$250,000 capital stock and \$450,000 of 40-year 5 per cent gold bonds for the construction of its proposed railway between Hornell and Bath, 24 miles. [E. R. J., Jan. 1, '10.]

**\*Hudson, Center & New Salem Electric Railway, Schafer, N. D.**—Press reports state that this company has been formed at Schafer for the purpose of building an electric railway to connect the three points. It is planned to build a power plant at Center. The proposed line is to parallel at some distance the extension the Northern Pacific Railroad is building north from Mandan.

**Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.**—J. McFarlane, a director of this company, is quoted as saying that arrangements would be made with the New York Central & Hudson River Railroad for a direct connection with its system. Options had been secured on several falls on the Ottawa River, west of the city, from which the necessary power would be developed for the operation of the company's lines. The location surveys had been completed for 18 miles, and estimates were in preparation, so that the grading could be started at an early date. The preliminary surveys showed the line would be almost straight from Ottawa to Morrisburg. [E. R. J., Oct. 9, '09.]

**\*Toronto, Ont.**—W. H. Price, Toronto, is said to be considering a proposition to organize a company to build an electric railway from Toronto to Barric, with branches to Orillia and Owen Sound via Mcaford, a distance of over 150 miles. Application will be made at the next session of the Legislature for a charter.

**Pittsburgh (Pa.) Railways.**—This company will build about 12½ miles of new track during 1910. C. W. Lepper, purchasing agent.

**Clarksville Railway & Light Company, Clarksville, Tenn.**—It is stated that this company, which is reported to have been purchased by interests represented by E. L. Fischer, Danville, Ill., will extend its lines to New Providence and Dunbar's Cave.

**Lakeview Traction Company, Memphis, Tenn.**—This company has applied for an amendment to its charter to enable it to run four lines through Memphis, namely, two north and two south, crosstown. The company is now building its line to Lakeview, Miss. W. W. Hayden, chief engineer.

**San Antonio (Tex.) Traction Company.**—This company is now building a 3½-mile extension to Lakeview, a suburb. All material is on the ground. J. J. King, general-superintendent.

**El Paso & Fort Hancock Railway, El Paso, Tex.**—This company advises that it has done considerable grading work on its projected railway between El Paso and Ysleta, 10 miles. It is the intention to complete preliminary arrangements so as to begin work Feb. 1. Three small culverts will be built along the route. The motive power has not yet been decided upon. Capital stock, authorized, \$100,000. Officers: C. N. Bassett, president; Felix Martinez, vice-president; Thos. O'Keefe, Chamber of Commerce, secretary; Winchester Cooley, treasurer, all of El Paso. [E. R. J., Oct. 2, '09.]

**Rutland Railway, Light & Power Company, Rutland, Vt.**—This company is said to be making surveys for an extension to be built during the summer to Lake St. Catherine, about 23 miles distant from Rutland and southwest of Fair Haven.

**Seattle-Tacoma Short Line Electric Railway, Tacoma, Wash.**—This company has filed for record at Tacoma a mortgage in favor of the Fidelity Trust Company, Tacoma, as trustee, to secure an issue of \$3,500,000 of 6 per cent bonds, dated July 1, 1909. The company has projected an electric railway from Seattle to Tacoma, 65 miles. [E. R. J., Dec. 25, '09.]

**\*Middlebourne, W. Va.**—I. M. Underwood, Middlebourne, is reported to be interested in a plan to build an electric railway to connect Middlebourne and Sistersville.

**Cincinnati Construction Company, Janesville, Wis.**—The Rate Commission has granted this company a certificate of public convenience and necessity permitting it to proceed with the construction of its electric railway between Madison and Janesville. Joseph Ellis, chief engineer. [E. R. J., Dec. 5, '08.]

#### SHOPS AND BUILDINGS

**Bowling Green (Ky.) Railway.**—This company will build a new concrete car house and repair shop. Work will be started early in the spring. H. D. Fitch, president.

**Tidewater Power Company, Wilmington, N. C.**—This company expects to begin work within the next 30 days on a new repair shop to be 50 ft. x 110 ft. The building will be of corrugated iron and heavy mill construction.

**Grand Forks (N. D.) Street Railway.**—This company is building a new brick car house in Grand Forks to be 50 ft. x 100 ft. in size.

#### POWER HOUSES AND SUBSTATIONS

**Bridgeport Electric & Railway Company, Bridgeport, Ala.**—This company, which has just been organized to construct a street railway in Bridgeport, also plans to contract, during the next few weeks, for apparatus for a 250-hp power plant.

**Pensacola Electric Company, Pensacola, Fla.**—This company has purchased a 300-kw motor generator set and a 500-kw turbine and auxiliaries.

**Chicago, Aurora & De Kalb Railroad, Aurora, Ill.**—This company advises that it expects to build two substations.

**Maysville Street Railroad & Transfer Company, Maysville, Ky.**—This company has purchased one 3-panel switchboard from Westinghouse Electric & Manufacturing Company.

**St. Louis & Kansas City Electric Railroad, St. Louis, Mo.**—This company is said to have completed negotiations for a power plant situated one-half way between its terminals, Kansas City and St. Louis. The company contemplates building an electric railway between the two points.

**Tidewater Power Company, Wilmington, N. C.**—This company is considering the purchase of a 500-kw rotary converter and two 125-kw, 375-1000-volt transformers. A. B. Skelding, Wilmington, purchasing agent.

# Manufactures & Supplies

## ROLLING STOCK

Rome Railway & Light Company, Rome, Ga., it is reported, will soon order two cars.

Quincy Horse Railway & Carrying Company, Quincy, Ill., will be in the market for eight single-truck cars this year.

Grand Forks (N. D.) Street Railway will buy two new double-truck cars and four second-hand, single-truck cars in the near future.

Little Rock Railway & Electric Company, Little Rock, Ark., expects to buy 10 double-truck, semi-convertible cars some time this year.

Compania Electrica y de Ferrocarriles de Chihuahua, Chihuahua, Mex., will buy four semi-convertible pay-as-you-enter cars within the next two weeks.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb., has ordered 16 rolled-steel wheels and eight axles, assembled, from the Standard Steel Works Company.

Chicago, Aurora & De Kalb Railroad, Aurora, Ill., is in the market for four interurban cars, one motor express car, one 60,000-lb capacity box car and one 80,000-lb capacity gondola.

Laredo Electric & Railway Company, Laredo, Tex., will buy two closed cars equipped with single motors and controllers within the next two weeks. The company will also buy one extra truck and motor for a work car.

Illinois Traction System, Peoria, Ill., has ordered four new eight-wheel caboose cars mounted on 50,000-lb capacity freight trucks from Hicks Locomotive & Car Works, Chicago, Ill. The cars are to be of the standard railway type; 34 ft. over end sills; 40 ft. over platforms; 9 ft. wide over side sills; 8 ft. 4 in. wide inside; 13 ft. 8 in. high over all.

## TRADE NOTES

Hess-Bright Manufacturing Company, Philadelphia, Pa., will open a Chicago branch at 1800 Michigan Avenue, about Jan. 20, 1910.

Mount Vernon Car Manufacturing Company, Mount Vernon, Ill., has let the contract for its new steel car plant to the McClintic-Marshall Construction Company.

Q M S Company, Plainfield, N. J., has removed its Chicago office from 1775 Old Colony Building to 737 First National Bank Building. John C. Hoof is the company's representative in the Western territory.

George L. Kippenberger, who for the last seven years has been purchasing agent of the St. Louis Car Company, entered the service of Forsyth Brothers Company, Chicago, Ill., on Jan. 1.

Roberts & Abbott Company, Inc., Cleveland, Ohio, announce that Walter Loring Webb has become associated with it and will represent the company in Philadelphia and vicinity. Mr. Webb's office will be in 1026 Real Estate Trust Building.

McKean Motor Car Company, Omaha, Neb., received orders during 1909 from 17 steam railroads for a total of 31 gasoline-motor combination passenger cars. The company also received orders for one gasoline-motor switching engine and two weed burners.

Chicago Bearing Metal Company, Chicago, Ill., has opened offices at 400 Od Colony Building, where it is prepared to take orders for manganese bronze castings, electric brass castings, steam metal castings and locomotive bearings. The company's factory is located at the Union Stock Yards, Chicago.

Wesco Supply Company, St. Louis, Mo., announces that R. C. Mellor, who has been connected with the company for a long time, has been appointed manager of the advertising department of the company to succeed Edward J. Jeep, who has resigned after 2½ years' service to become business manager of the Classified Ad. Company, St. Louis, Mo.

American Creosote Works, Inc., New Orleans, La., has elected E. L. Powell vice-president and W. Scott Bryan secretary. A new plant will be completed at Bossier, La.,

by Jan. 15, 1910. The new plant, which will occupy 35 acres of ground, will have a capacity of about 30,000,000 ft. per year and will have direct track connections with the railroads.

Milliken Brothers, Milliken, S. I., New York, N. Y., the affairs of which were placed temporarily under the protection of the Federal Courts on June 11, 1907, have had the receivership terminated and the entire plant and all its assets having been restored new officers and directors have taken control as follows: Edward C. Wallace, president; Gilbert G. Thorne, Gates W. McGarrah, E. C. Wallace, A. A. Fowler, Clarence M. Lewis, Wm. Barclay Parsons, C. H. Zehnder, directors; Francis Dykes, general manager. Milliken Brothers announce that the structural steel business established 50 years ago will be continued in all its branches, including ornamental iron work and galvanized steel towers for electric transmission, in the most active and efficient manner and the company's foreign business will be carried on and extended.

Nachod Signal Company, Philadelphia, Pa., exhibited its type C signal for single-track trolley roads at the Denver convention, and since that time has delivered signals to a number of roads in various parts of the United States, among which are: Mahoning & Shenango Railway & Light Company, Youngstown, Ohio; Public Service Railway, Newark, N. J.; Chicago & Milwaukee Electric Railroad, Highwood, Ill.; Spokane & Inland Empire Railroad, Spokane, Wash.; Fort Smith Light & Traction Company, Fort Smith, Ark.; Little Rock Railway & Electric Company, Little Rock, Ark.; Chattanooga Railway & Light Company, Chattanooga, Tenn.; Los Angeles Pacific Company, Los Angeles, Cal. The type C signal is an automatic signal, as distinguished from a dispatcher's signal system, and is operated by a trolley contact switch. But one line wire is required, and the system of signalling is what is known as permissive or car counting, indications being given by both lamps and semaphores simultaneously.

United States Electric Signal Company, West Newton, Mass., installed a large number of its automatic block signals on electric railways during 1909. The roads equipped and the number of blocks installed were as follows: Boston (Mass.) Elevated Railway, 4; Mattoon (Ill.) City Railway, 3; Boston (Mass.) Suburban Railways, 16; Aurora, Elgin & Chicago Railway, Wheaton, Ill., 2; New Jersey & Hudson River Railway & Ferry Company, Edgewater, N. J., 19; Northampton (Mass.) Street Railway, 15; Joliet & Southern Traction Company, Joliet, Ill., 3; Holyoke (Mass.) Street Railway, 7; Tampa (Fla.) Electric Co., 2; Charlestown (S. C.) Railway, Gas & Electric Company, 5; Savannah (Ga.) Electric Company, 2; Rio de Janeiro Light & Tramway Company, 6; Worcester (Mass.) Consolidated Street Railway, 6; Chicago & Joliet Electric Railway, Joliet, Ill., 1; Birmingham (Ala.) Railway, Light & Power Company, 2; Fairmont & Clarksburg Traction Company, Fairmont, W. Va., 2; United Traction Company, Albany, N. Y., 1; Elmira, Corning & Waverly Railroad, Waverly, N. Y., 8; Knoxville (Tenn.) Railway & Light Company, 1.

## ADVERTISING LITERATURE

Western Electric Company, New York, N. Y., has published a pamphlet in which are illustrated and described a number of types of portable telephone sets for railway service.

Kilby Frog & Switch Company, Birmingham, Ala., has issued Catalog No. 5 for 1910, in which is listed the company's complete line of frogs, switches, crossings and special work for steam and electric railways.

American Wood Working Machinery Company, Rochester, N. Y., has issued a wall calendar 15 in. high x 16½ in. wide. The calendar proper is 5¼ in. high x 9 in. wide. The same views of the company's works appear at the top of each sheet, but views of different machines made by the company serve to decorate the sides and bottom of each sheet.

Calendars for 1910 have been received from the Buda Company, Chicago, Ill.; Ohmer Fare Register Company, Dayton, Ohio; H. B. Underwood & Company, Philadelphia, Pa.; Duff Manufacturing Company, Pittsburgh, Pa.; Samson Cordage Works, Boston, Mass.; American Wood Working Machinery Company, Rochester, N. Y.