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ARBITRATION VERSUS STRIKES

From the report just issued by the Amalgamated Association it appears that in the six months ending with December last there were eleven strikes and lockouts, involving 1723 members of the association. In the same period there were fifteen arbitrations of disputes in which 23,000 members were interested. Aside from the obvious conclusion to be drawn from these figures as to the extent that arbitration has superseded strikes, the comment of the association's officers thereon is of interest. "A study of the arbitration cases," the report says, "points to the fact that arbitration, as a general proposition, effects a compromise with results about evenly divided, although the record of arbitration cases for the six months rather favors the employing companies. But arbitration is known to be supported by public opinion, and it would be suicidal for this association, the members of which are engaged in public utility employment, to refuse arbitration in any cases where a fair method of arbitration is possible." The report states that the association now has 188 written agreements with electric railway companies.

THE "MOVIES" FOR ELECTRIC RAILWAYS

The increasing use of the moving-picture film in electric railway educational and safety work shows the alertness and wisdom of managers in utilizing a popular agency for doing a much-needed work. It is a trite saying, but one worthy of constant application, that the surest entrance to the intelligence is through the "eye-gate." The moving picture provides the vehicle for conveying vivid impressions by way of this entrance. Let us note the following salient facts. The moving-picture film is expensive, but the apparatus for projecting the pictures is comparatively cheap. The needs of one railway company are akin to those of another, and a picture which teaches a safety or other lesson in one place can do the same thing in another. The moving-picture theaters use films in circuits, thereby cutting down the expense of exhibitions and preventing the accumulation of unusable films. Why is there not a suggestion here for our business also? A central agency could have scenes "staged" and films printed for circulation at nominal cost among subscribers. The money now being spent by individual companies for films is probably nearly enough to finance the proposition. Why not get together now before any money has been wasted through duplication of initial expense? The office of the American Electric Railway Association would be the natural and most efficient clearing house for this work, and a special committee

of men already active in this line could take the initiative and plan the campaign.

WHY ADHERE TO THE MONITOR DECK ROOF?

In this age of crass materialism it might perhaps seem unnecessary to decry any efforts made toward the perpetuation of artistic effect and inherent grace of outline. Nevertheless we feel constrained to side with the open advocates of the exclusive use of arched roofs for street cars even though this course may be fraught with danger to higher ideals. That the monitor-deck roof has held its own in the affections of many street railway men during the past few years is evidence that all are not devoid of the desire for beauty in car design. At least this is the reason given, in nine cases out of ten, for the retention on new cars, notwithstanding its greater cost and weight, of the monitor roof, the estimates varying from \$50 and 200 lb. to \$100 and 500 lb. per car—to say nothing of its cost of maintenance. In the tenth instance the reason given by a railway for adhering to the monitor-deck roof will be the supposititious lack of ventilation in arched-roof cars, but as it will often be found on the same railway that the cars are provided with ventilators in the monitor and that the deck sashes are fixed in place, this reason can hardly be taken very seriously. As a matter of fact, there was every reason for the monitor-deck roof in the days before the development of the ventilator. Now, when there are many thoroughly practical ventilating devices on the market, the reason for its existence has become limited to the fact that its appearance, through habit, is less offensive than that of the plain arch. To adhere to it on such grounds is no more logical than to condemn the small wheel for city cars because it looks insignificant.

THE SMALL WHEEL COMING INTO ITS OWN

It is encouraging to find the small car wheel growing rapidly in favor, for there is available in car design hardly any better means for economy than its use. Its practicability has been demonstrated beyond a doubt, and its sponsor, P. N. Jones of the Pittsburgh Railways, is even now extending its use to high-speed service on one of the company's interurban lines. The saving in weight with small wheels and trucks and with motors to suit, approximates 2500 lb. per car over the lightest kind of two-motor equipment, and if the assumption is accepted that unnecessary weight on cars costs 5 cents per pound per year this would practically pay the interest charges on the investment for the new features of the equipment. Under the new conditions

the old question as to the relative advantages of a 32-in. rolled-steel wheel with a light rim that is not turned, and of the 34-in. wheel that is turned three or more times, loses much of its interest. Indeed, the greatest advantage of the 22-in. or 24-in. wheel, as we have pointed out before, is due to the fact that it permits a reduction in the height of car floor to the point where it can be reached with two easy steps. The indirect result of this is that passenger movement is accelerated, accidents are reduced and complaints are lessened, so that the benefits, when summarized, extend far beyond the immediate savings that can be directly computed. The "baby" motors necessitated by the small wheels have long since passed out of the experimental stage as they are no longer the product of but one manufacturer and hundreds of them are in successful operation. In the light of these facts it is not surprising that the progressive properties are taking advantage of the opportunity for economy which has become available, at least for all new cars.

TOLEDO FIGHT BECOMES A FARCE A situation at Toledo which might easily have become very serious has been turned into a farce by the good judgment displayed by the company in dealing with the fare complication. An attempt of the city to impose a flat 3-cent fare on the company upon the expiration of franchises on March 27 was met by an announcement that this was not in accord with the agreement and would be disregarded. It was also definitely announced that passengers tendering 3-cent fares in other than the "workingmen's hours," for which this fare now prevails with the consent of the company, would be carried free. The novel idea of free car rides naturally attracted much public attention. The records of the company show that each day a majority of the riders have paid the regular fares. Only a minority have taken advantage of the situation. The proportion of the total riders who traveled free under the offer of the company has decreased materially. This is a clear indication that the people of Toledo are not in sympathy with the effort of the politicians to force a settlement without regard for the decencies of fair play. The policies of the company in handling the delicate situation created by the crisis of expired franchises were at once masterful and conservative. They could not provoke conflict. They were notice to the effect that if conflict came it would have to be precipitated by the opposing side. No one can find any sane ground for a quarrel with a company that offers free rides to passengers who will not pay its regular rates of fare. The position of the company is that it has a legal and a moral right to certain agreed rates of fare. It tries by argument and persuasion, through meetings, newspaper advertisements, posters in the cars, as well as through its conductors, to lead people to accept its point of view. If the people will not do so, they are the guests of the company for the ride. It is a notable experiment that is being made in Toledo. We do not recollect an instance of a similar one. In making it Mr. Doherty plainly and frankly counted on the sense of justice that he believed would

prevail when the people understood the facts. He has shown that the 3-cent fare is not adequate in Toledo. If the long-standing, discreditable franchise imbroglio in Toledo is settled on lines that are fair to each interest concerned such a result will undoubtedly help the industrial reputation of the city. It is greatly to be hoped that a fair settlement will be the final outcome of the extraordinary events of the last week.

FARE INEQUALITIES AT BOSTON

The report of the Boston joint commission on electric railway transportation, which was briefly abstracted in a recent issue, is an attempt to bring at least some relief to an admittedly difficult problem. Could the Boston transportation system be designed *de novo* the work would be fairly simple. But it is an entirely different matter to outline now a course which will be fair to all of the interests involved. Perhaps the most interesting feature of the report is the recognition by the board that inequalities in fares are inevitable in such a community as Greater Boston under the conditions of its past development and the present distribution of service. At the hearings before the board strong demands were made by many suburban communities for a 5-cent fare to and from the heart of Boston proper, and many inequalities were pointed out in relation to fares and distances from the business district. It was shown that in some cases suburbs located closer to the center of Boston than others are unable to purchase as much transportation for a nickel as the latter, and in the particular instance of Hyde Park, a newly added ward of Boston, a 10-cent through fare is in force through the joint occupancy of the extreme southern portion of the city by the Boston Elevated and Bay State Street Railways. Residents of Chelsea, on the north side of the city, were also aggrieved because of their inability to journey beyond the center of Boston after the payment of a single 5-cent fare, whereas the residents of Newton Corner, Watertown and other suburbs are literally unrestricted in their ability to travel over practically all portions of the Boston Elevated system for a single fare. Here again, the existence of two companies in the same metropolitan district creates inequalities.

The commission points out that while it may seem theoretically that every passenger should be able to ride an equal distance for the same fare, no matter where the ride begins, there is no practicable way of bringing about such an ideal arrangement. No system has ever been put in operation which will accomplish this result. Even the zone system fails to do it, as it provides merely that the fare from any point within a given zone to any point in another zone shall be the same. On the Hungarian steam railroads, for example, the first zone is 15 miles wide and the second 9 miles, and a passenger pays the same fare for traveling 1 mile that he does for 15, or the same for traveling 15¼ or 24 miles. The inequalities in the Boston district are not arbitrary but are the result of a natural development in the course of which all communities have benefited, though some more than others. Some of the

existing disparities are the result of physical and topographical conditions which cannot be eliminated and which can be offset only at enormous cost.

In some cases present difficulties are due to the lack of foresight of residents of suburban communities twenty-five years ago, when the street railways serving the central portion of the Boston district were consolidated into the West End Company. Thus, the Lynn & Boston Railroad was not included in this consolidation, largely on account of opposition from representatives of Chelsea and Revere, who feared that the consolidation would result in a monopoly and in an increase of fares between those places and Boston. It is largely because of this opposition that these communities find themselves to-day in the position of complainants. The consolidation actually resulted in a comprehensive and unified car service for Boston and most of its suburbs, with the establishment of many through lines, reduction of fares, establishment of an enormous transfer system and many other service improvements. The average length of a half round trip has increased from 3.62 miles in 1889 to 4.28 miles in 1913 between the center of Boston and suburban points. Where trips are made over the two systems, however, it has been impossible for the public to realize all the benefits of unification, and this situation was the source of most of the specific complaints which were heard by the board.

Under the terms of its charter the Boston Elevated Railway cannot be required to charge less than a 5-cent fare for a continuous ride in one general direction between any two points on its system, and this stands in the way of the establishment of low joint through rates shared by the Bay State company and necessarily leads to the payment of two fares in many municipalities served in part by each company. The fundamental difficulty of avoiding the payment of two fares on inter-system journeys has been emphasized in numerous decisions by the Massachusetts Railroad Commission, and it seems clear that nothing short of a comprehensive rearrangement and articulation of all the steam and electric lines serving Greater Boston can eliminate the principal fare inequalities and apparent discriminations brought out at the hearings. Perhaps no portion of the board's report is of greater interest than its refusal to recommend that the Boston Elevated Railway lease the lines of the Bay State company in Hyde Park in order to yield a 5-cent fare to that portion of Boston proper. The residents of that ward contended that a lease should be consummated along the lines established some years ago in West Roxbury. But the commission points out that the distance involved is greater than that asked for by any of the other communities in appearance; that the single-city-single-fare principle often recognized by the railroad commission has never been regarded as an inflexible rule; that it has with one exception been confined to the lines of a single company; that in numerous instances acceptance has been refused to the plan where the length of ride involved (10 miles to the center of Boston in the Hyde Park case) was unreasonable because of the financial condition of the company controlling; and that if the appeal should be

granted, the extension of the precedent to a dozen other suburban communities would probably result in financial disaster to the Boston Elevated Railway and would arrest street railway development in the metropolitan district.

THE DEMAND FOR SUBWAYS

One of the characteristic developments of the last few years in city transportation has been the demand on the part of a great many cities for subway systems. Undoubtedly this has been due in large part to the great success from a transportation and financial standpoint of the New York subway. Many prominent citizens from other places after visiting New York have returned home enthusiastic over subway operation and impressed with the belief that the local railway system in their own town should provide rapid transit by subway within the center of the city and under important traffic arteries. The plan naturally appeals to the civic authorities and to the citizens who do not realize that the profitable nature of the New York subway is due entirely to the great density of population and the peculiar topography of the city which compels a great deal of long distance riding, and that in most cities with a distributed population the construction and operation of a subway system as a purely commercial enterprise is financially impracticable. The fact is, that subway service is a luxury which only the very largest cities can afford, and even in New York the last subway contracts are being subsidized by the city, which practically guarantees the railway companies against loss from their operation.

There is no doubt that in a great many cases a city can afford to subsidize a rapid transit system and more than make up indirectly for the direct loss from the construction of the line. We believe in the economic value to any city of the best kind of transportation which the circumstances warrant. It contributes not only to the material welfare of the citizens because of the saving of time effected, but it also adds to the growth and wealth of the community because of increased real estate values. The cost of this improvement, however, should be borne directly by those who profit by it. We believe it is also the duty of the local railway company which possesses the monopoly of transportation within any city, and hence will be one of the beneficiaries by its growth, to do all that it reasonably can to co-operate in establishing such a transportation system.

One of the cities which is now facing the question of subways is Philadelphia. A comprehensive system has been planned under expert advice, the future traffic up to 1930 has been estimated with more care than has probably ever been devoted to a similar problem, and negotiations are now under way with the Philadelphia Rapid Transit Company as to the conditions under which it will consent to operate this system. So far, the ideas of the city authorities and the railway company as to the proper form of contract seem to be far apart, but perhaps this is only natural in the early history of the undertaking. A contract of this kind is necessarily

subject to bargaining. But we trust for the interests of the city that the negotiations will not be as long drawn out as in New York. Each side is dependent on the other, and if both company and city are willing to recognize the part which the other can play in effecting this improvement a conclusion ought not to be long delayed.

The experience of the past indicates that the company is ready to do its part in supplying the public with good transportation. During the past few years, or under the present Stotesbury management, it has provided 1580 new cars, two new carhouses with a capacity of 669 cars, and 28,000 additional horse-power, and has raised the maximum wages of its men 7 cents an hour. It is easy to understand that it should desire now to go slow in assuming additional obligations in view of the fact that it has never paid a dividend on its present paid-up capital of \$30,000,000, and for the eight months ending March 1, 1914, had a surplus of only \$189,017.

CLAIM BUREAUS

In 1910, at the urgent recommendation of the Claims Association, the American Electric Railway Association made an arrangement with the Hooper-Holmes Information Bureau to become a clearing house of the association for information about accident claims and for the use of the files of that bureau. This action was the result of a number of years of discussion as to the best method for generally indexing accident claims on electric railways, and the arrangement thus completed was expected to fulfil the need which had long been felt for a central exchange of this kind. There have been continuous complaints, however, that the railway companies have neglected to utilize the opportunities thus afforded or to co-operate with the bureau. These complaints have been heard not only at meetings of the Claims Association but at meetings of other associations. Even as long ago as November, 1912, Mr. Tichenor at a Central Electric Railway convention called attention to the fact that during a recent year of the 350 companies authorized to receive the benefits of the national bureau only sixty companies reported to it and of that number six did two-thirds of all the reporting.

The subject is again called to the attention of railway companies by a letter published in this issue from President Weh of the Claims Association. It is difficult to understand the reasons for the refusal of the companies to avail themselves of a plan which the association is financially supporting. No man engaged in a large mercantile business on a credit basis would attempt to conduct his affairs without his Dun or Bradstreet, yet this is practically what the electric railway companies are trying to do in their claims department unless they use this bureau. The Hooper-Holmes organization is essentially a credit organization of the claimants in the field, but, unlike the Dun or Bradstreet companies, it has necessarily to depend very largely upon its subscribers for the information

to complete its credit records. If these reports are not forthcoming, the whole system falls to ground. If the managements realized the importance of this matter as thoroughly as do the claim agents, we do not believe that there would be further cause for complaint.

ENERGY AND TIME ANALYSES IN RAILWAY OPERATION

Some strange anomalies present themselves to the student of electric railway economics. One of these is that every railway carefully meters the energy that goes from the power and substation to each feeder section, but very few keep any account of how much is used on the passenger cars or in the carhouse, shop, track and service car operations. Another anomaly is that the motorman and conductor who are the salesmen of the railway's only commodity, transportation, are at liberty to hurt the sales by hurrying over one section of their route, dawdling over another and perhaps even failing to visit some traffic territory at all. This is a practice which has been found to occur on several suburban lines and is brought about by the crew turning the car back without orders before it reaches the end of the line.

The absurdity of having no check upon the use of electrical energy by the different crews will be clear from a parallel with any gas company's practice. Like the railway the gas company knows how much illuminant (kw-hours) it produces and how much is lost through leakage in the pipes (drop in feeder and line circuits) between the tanks (power and substations) and the consumer (car). Here the parallel ends, for the gas company has a meter at the ultimate points of use whereas the railway has none. Of course, it will be urged that the relation of the gas company to the consumer and of the railway to the motorman are not the same. But wherein do they differ in principle? To be sure, the user of gas has to pay for it, for no gas company would think of offering him a flat monthly rate based simply upon the number of his burners. Both parties naturally find it preferable to deal only with exact quantities. On the other hand, the motorman does not pay for the energy that he takes from the line, and he is free to be even more prodigal with it than a gas user who has a flat rate.

The possibility of charging a motorman with the energy used on his car would seem chimerical were it not for the fact that London taxi operators actually do pay for their own gasoline. However, the essential point is that every car should be equipped with a device which will make the motorman as careful with electric fuel as the taxi operator is with liquid fuel. This is not only a question of saving energy but of eliminating the inefficient man and the antiquated, uneconomical car. The particular type of car meter to be used is of far less importance than recognition of the fact that the present practice of confining energy measurements to powerhouses, substations and feeders is utterly inadequate. Furthermore, large quantities of unmeasured energy may be taken from the line for such purposes as track and shop welding, machine tool operation and pit lighting. One must have a great deal of optimism to be-

lieve that those who take energy in this way will concern themselves deeply about its economical use or the bad effect which it may have on line voltage. It is not flattering to the clear-sightedness of American operators that they should not see this point until they have to pay so many dollars per month for power purchased from local central or hydroelectric stations. In this respect they have a great deal to learn from the operators of European electric railways who are frequently obliged to purchase all of their electrical energy from the local municipal plant. The result is that a kw-hour is treated like money that has to be paid out to the other fellow and not like a coin that is transferred from one pocket to another.

The second absurdity to which attention has been directed is that so little exact knowledge is obtained about the movements of the crews while on their runs. This is especially true of suburban and interurban lines with long headways where the inspectors are too few to catch all disobedience of orders. In such cases all that may be known with certainty about a crew is the time that it left the operating station. The management does not know whether the car made all stops necessary to pick up the traffic and whether it maintained the proper running speed and car spacing. Yet here, too, simple means are available to record the goings and comings of the men on the cars just as readily as of the men in the shop. On one large foreign city system, for example, time points are fixed for certain intersections throughout each route, and every lapse from the schedule is liable to be checked by inspectors at these points. Several American railways have improved on the time-point idea by using printing clocks in which the motorman and conductor insert some standard form of time card. By shifting these registering clocks to different points occasionally and averaging the better readings, a railway could obtain a wonderfully exact running card for all divisions so analyzed. Here again, the application of exact methods to what has hitherto seemed a quite intangible part of the railway business will first weed out the negligent platform man and then point the way to the preparation of better time tables and the better utilization of the car mileage.

THE CONTAGION OF AMBITION AND CO-OPERATIVE EDUCATION

A letter from the master mechanic of the New York State Railways printed last week calls attention to a factor in educational work which is sometimes overlooked. Some young men in his employ have been allowed to spend part of the day in school, working during the rest of the time in the shops on the so-called co-operative plan. He makes the significant statement that these men are having a beneficial, stimulating influence on their companions, who are taking to studying out of hours. Few in number as are the co-operative students, the germ of ambition which is stimulating them has infected their associates. What could not be forced on the larger mass of employees has reached them by contagion. The efforts of the management,

therefore, have been supplemented and reinforced. If ambition is contagious in this way, there is much hope for the future of the industry and the individual.

The plan used in Rochester is to have the boys spend a part of each day, under pay, at a local school and part at the shops. This scheme differs from the Cincinnati plan, regarding which a letter was printed in the issue for March 14, and in which for administrative reasons, a greater frequency of alternation between shop and school was considered desirable. The success of both plans, however—and they have been successful—has depended not so much on the methods followed as upon the spirit in which they have been applied. The success, as it appears to us, has resulted for several reasons. Technical education has been made possible to boys to whom it would otherwise have been out of reach. Many of another class who had the means for further schooling would have been overschooled had they not had this opportunity to see the relation of shop and school and to allow the law of attraction to help them in choosing a career. Those who needed and could profit by more mental training have been prevented from becoming bookish by their contact with shop conditions. Finally, all co-operative students realize that there is more to success in life than can be learned from teachers and books, that they must learn to get along with all sorts and conditions of men.

Our present system of education tends to over-train some boys who would have been more useful, and therefore happier, if they had been "switched off" into industry earlier. Many parents, particularly those who had not themselves many educational privileges, look on education for their sons as a relief from the necessity for toil. How often is heard the expression: "I hope my son will not have to work as hard as I have!" Their sons are therefore put through elaborate training, in college in many cases, only to be a disappointment to the parents. Education is a success only as it makes its recipient more useful. The co-operative plan appeals to us as tending to impress this fact.

Electric railway men interested in the development of their employees are inclined to wonder why the efforts made by the apprentice-training and educational committees of the American Electric Railway Engineering Association, the American Electric Railway Association and other technical societies do not accomplish more. Elaborate plans are prepared and a great deal of discussion takes place, yet nothing seems to result. There are at least two reasons for this as far as the railway associations are concerned. In the first place, these committees have no salesmen in the field to bring their propositions to the attention of the responsible officers of the member companies. Second, this training movement must proceed from within the company organization, beginning with men of conviction and personality, and all that outside influence can do is to inform and suggest. We do not, however, believe that the work of these committees is a failure. Rather, the results are indirect in keeping in circulation the training spirit, even if the plans are not adopted wholesale.

Sixty Recent Cars for Baltimore

These Cars Differ from Preceding Baltimore Types in the Use of More Steel in the Underframe, Cast-Steel Instead of Built-Up Iron-Plate Bolsters, Tungsten Lighting, Etc.—Route Number Signs Have Also Been Introduced for General Application

During December, 1913, the United Railways & Electric Company, of Baltimore, placed in service upon the Edmonson Avenue line the third consignment of sixty prepayment semi-convertible cars received from The J. G. Brill Company to replace open and closed cars. The general dimensions of the new car are as follows: length of platform, 5 ft. 8½ in.; length over corner posts, 30 ft. 8 in.; length over all, 43 ft. 9 in.; maximum width, 8 ft. 5 in. The exterior of the car is similar in design to the large number of pay-as-you-enter cars now in operation in Baltimore, but the new type has a few important improvements over its predecessor.

DOORS, SEATS AND GENERAL FINISH

The entrance to the car proper is gained by a pair of sliding doors which give a 26½-in. opening. On the extreme left is a single-door with 23½-in. opening, which



Baltimore Car—View Showing Route Number Sign

swings inward for emergency exit. This door has door stops at the top and bottom which hold the door open when necessary, particularly during the hot summer months. The regular car-body exit is formed by the double sliding doors on the right at the front end.

The seating of the car is an arrangement of four longitudinal seats extending the length of the first two windows at each corner, the rest of the car being furnished with fourteen transverse reversible spring rattan seats 36 in. wide. The aisle space between these transverse seats is 21¾ in. The longitudinal seats at the two diagonal corners by the swinging doors have a portion arranged to fold downward to permit the opening inward of the swinging doors. The total seating capacity of the car is forty-two passengers, twenty-eight on the transverse seats and fourteen on the longitudinal seats. The use of pressed-steel pedestals, wall and aisle plates in the Hale & Kilburn transverse seats represents a saving of approximately 25 lb. per seat over seats of similar dimensions made up with malleable-iron castings.

The ceilings are covered with agasote, which has been sanded smooth and, after being painted light-buff

color, has a ½-in. aluminum black-edged stripe. The interior finish is natural cherry. The interior moldings are very plain so as to require the least work in keeping the car clean.

CAR FRAMING

The wooden sills are 2¾ in. by 6⅞ in. The steel sill plate measures 5/16 in. x 16½ in. The sill plate by means of a drop-forged corner iron is held by rivets to the end sill, which is a 10-in. channel. The center knees are securely riveted to the end sill by means of a ⅜-in. gusset plate, thus forming a very substantial and stiff underframe. A further change has been made in the pair of stringers running from the intermediate crossing through the bolster to the 10-in. channel at the end sill. Instead of these stringers, which were formerly of wood covered with a heavy angle iron, a pair of 3-in., 5.5-lb. I-beams are used. These are securely riveted by means of angles and Z-shaped plates to the 10-in. channel and gusset plate near the platform. Where the I-beam stringers meet the intermediate crossing fastening is made with angles riveted to the I-beams and then bolted to the crossing. The floor boards are all hollow back to reduce the weight.

The car-body bolster, instead of being built up of iron plates and cast-iron spools, which are not only difficult to construct but liable to entail heavy maintenance expense, is now made of cast steel in one piece. This bolster was designed by the United Railways & Electric Company to carry a specified center-plate load and with a large factor of safety. Holes in the bolster admit air pipes, I-beam stringers and hand-brake pull rods.

Like the previous cars of this type, the platform supports are made of light channel irons.

SANDERS, BRAKE RIGGING, BRAKES, TRUCKS, ETC.

The car is equipped with four sand boxes of the "Dumpit" type, two of which are placed beneath platforms and two in the corner of the car under the longitudinal seat. The sand boxes at each end are operated simultaneously by means of a hand lever connected to a rocker shaft. The hand-brake rigging is a system of chain sheaves which avoids an elaborate system of levers and produces excellent hand-brake rigging with a slight saving in weight. The car body complete with foundation brake rigging, etc., weighs approximately 16,350 lb. The air brakes are the Westinghouse Traction Brake Company's SM-3 equipment in connection with a type F automatic slack adjuster. This use of slack adjusters has made it feasible to change from daily to weekly inspections. Both the "G" governor and the "DIF" compressor have a number of small details introduced in their construction, as required by the railway company's specifications. One important feature is the method of suspension. Instead of using a pair of cradle-type brackets, three brackets are bolted to the compressor near the top, two on one side and one on the side opposite. These in turn fit into supports bolted to the car underframing, thereby securing three-point suspension. The motorman's valve has a special guard of home manufacture to prevent grease getting on the clothing of passengers while standing on the rear platform. The brake cylinder is 10 in. in diameter. The total weight of the air brake equipment, including all of the pipes and fittings, is about 1300 lb.

The cars are mounted on a pair of Brill 27 GE-1 trucks. The Symington journal boxes are of a type specially designed for the railway, using its standard check plates and bearings. The back of the box is fitted with an M. C. B. wooden dust guard. The journal-box lids are of malleable iron. The axles are Cambria heat-treated steel $4\frac{1}{2}$ in. in diameter with 4,885-in. gear seats and 4-in. journals. Solid gears are used and are pressed on with from 45 tons minimum to 60 tons maximum pressure. The wheels are cast iron 33 in. in diameter. The brakeshoes have the separable heads and steel backs of the American Electric Railway Association's standard design. The truck brake rigging is the United Railways & Electric Company's standard slide brake. The approximate weight of the two trucks is 12,700 lb.

ELECTRICAL EQUIPMENT AND LIGHTING

The electrical equipment consists of four 246-B motors operated by two K-35 G-2 controllers. These motors have some special features required by the railway's specifications, the most prominent of which are the field coil terminals, brush-holder design and an improved method of lubrication for the axle bearings. The controllers also include some special features, the most important being the rearrangement of the controller connections to prevent excessive burning of controller fingers and segments. At the base of each controller finger is a casting fitted with set screws which comprises the terminal. The resistance as furnished consists of two boxes, one containing twenty-eight grids and the other eighteen grids. Fifteen-tooth special-grade hardened pinions made by the Tool Steel Gear & Pinion Company were used in connection with hardened sixty-nine-tooth solid gears made by the same company. The gear cases are of malleable iron. Two standard GE circuit breakers altered to meet the specifications of the railway are a part of this equipment. There are also one GE form A aluminum-cell lightning arrester and one choke coil.

The cables within the car are placed in a transite-lined cable box running the length of the car. The leads of the cables running to the controller, motor, resistance and ground are placed in conduit, extending below the platform or floor of the car. The complete electrical equipment including conduit and fittings weighs approximately 11,850 lb.

The car-wiring schemes used in Baltimore were described in the *ELECTRIC RAILWAY JOURNAL* for April 8, 1911. The present cars are wired in much the same manner, except that the $12\frac{1}{2}$ -cp lamps have been replaced by 23-watt tungsten lamps. Wires are run in conduit for the heaters, although at the present writing no heaters are installed. At each intermediate post a pearl push-button is supplied in connection with a Faraday monitor buzzer at each end of the car for passengers' signals. This circuit is operated by a Patterson battery set model B-R-3 (three cells in series). This battery set, which is inclosed in a metal box and placed under one of the longitudinal seats, is kept locked at all times to prevent the stealing of the cells. All wires which form the lighting circuit are placed in grooved moldings. Each platform has two lights on the transverse center of the hood, arranged to burn simultaneously with the front headlight. As a result of a tungsten lamp test which was conducted recently on a number of cars, the new cars are being equipped throughout with the General Electric Company's 23-watt, 110-volt Mazda lamp. There are twenty-four lamps in each car, twenty of which are burning at any one time.

FARE REGISTRATION, ETC.

Each car is supplied with one International Cash Reg-

ister Company's automatic coin-counting fare box of a type designed for Baltimore. The registration of fares is supplemented with two International R-7 registers. A register rod, which passes through the car, communicates by a small rod at either end with one of the registers; the standard practice of the railway company is to use the forward register. The fare box is carried



Baltimore Car—View of Interior Showing Tungsten Lamps

upon a sliding railing, so that when the car is reversed the railing can be raised up out of the way and the fare box carried to the other platform.

The installation of the complete electrical and air-brake equipment was made at the shops of the United Railways & Electric Company. As promptly as the cars were received from the builder they were turned out fully equipped at the rate of two a day. The complete car weighs, without passenger load, 42,200 lb. The new car weighs 1004 lb. per seated passenger.

The complete specifications, covering all details in connection with the car body, trucks, electrical and air-brake equipments, were prepared under the direction of A. T. Clark, superintendent of rolling stock and shops, subject to the approval of William A. House, president.

SOUTH AMERICAN SECTION OF WORLD TRADE DIRECTORY

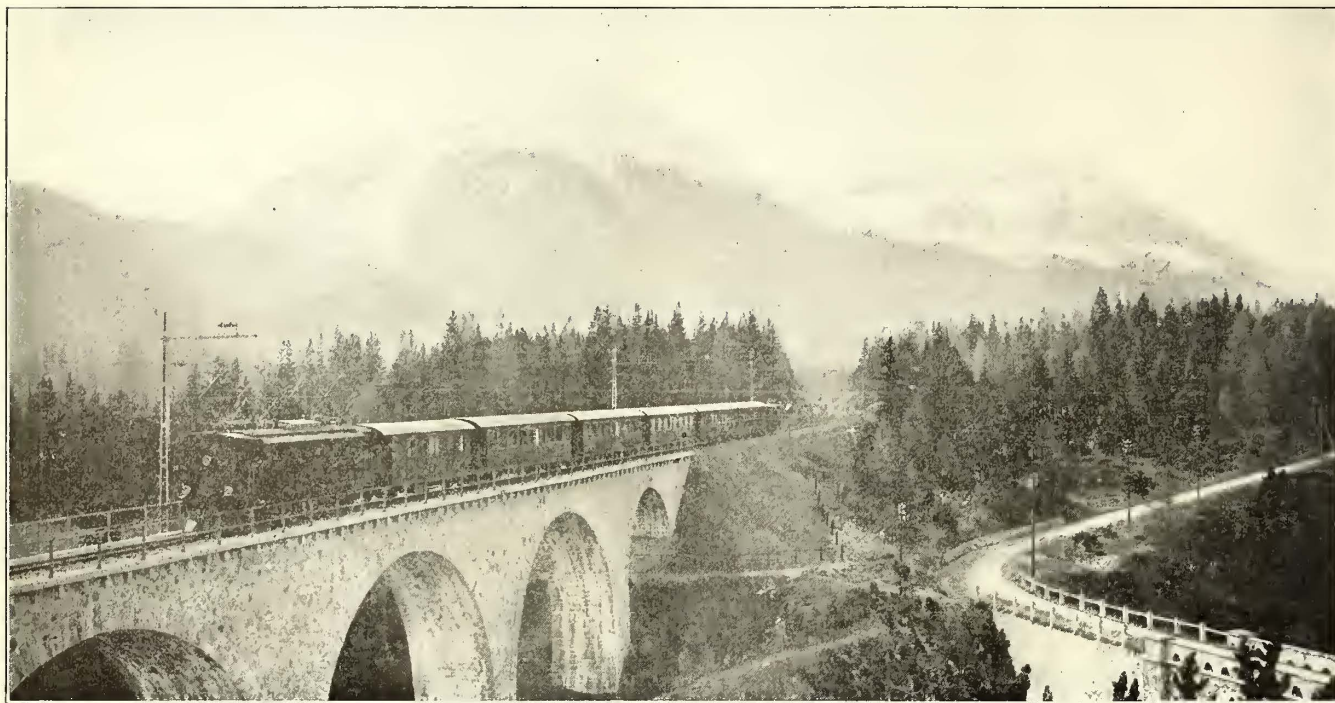
A complete revision and detailed classification of the names of South American importers and merchants, made by the American consular officers in co-operation with the Bureau of Foreign and Domestic Commerce, has been published as a section of a new edition of the World Trade Directory. The lists have been brought up to date and are presented in uniform style, with a finding index. A new feature is the listing, so far as the information could be obtained, of the American and other foreign agents of South American importing firms and of the names of the parent firms of branch houses located in various South American cities. The directory does not aim to include the names of South American exporters, nor are the names of manufacturers given, except those who are, or seem likely to become, purchasers of American materials or merchandise. The publication is a directory of South American buyers for use by exporters and manufacturers in the United States. The directory is in octavo form, bound in buckram, and is sold at \$1 a copy, to cover partially the cost of printing. Those desiring one or more copies of the directory should apply to the Bureau of Foreign and Domestic Commerce for the necessary order blank.

Single-Phase for the Rhaetian Railway

The Rhaetian Railway Is One of the Most Important Narrow-Gage Lines in Switzerland and Part of It Has Recently Been Electrified. A Novel Feature of the Locomotive Described in This Article Is That the Rotors and Stators of the Motors Are Fed at Different Voltages

The Rhaetian Railway, which operates a network comprising about 186 miles of meter-gage (39.37-in.) track in the canton of Grisons, Switzerland, is being changed from steam to electric traction. The first lines to be electrified are those of the Engadine, a valley

The locomotive possesses a closed body, divided into the apparatus room and two cabs for the engineer. The electrical equipment is composed of the motors, the transformer, the control system, the current collectors and the auxiliary apparatus.



Rhaetian Railway—Locomotive Hauling Train over Viaduct on a Bracket Catenary Section

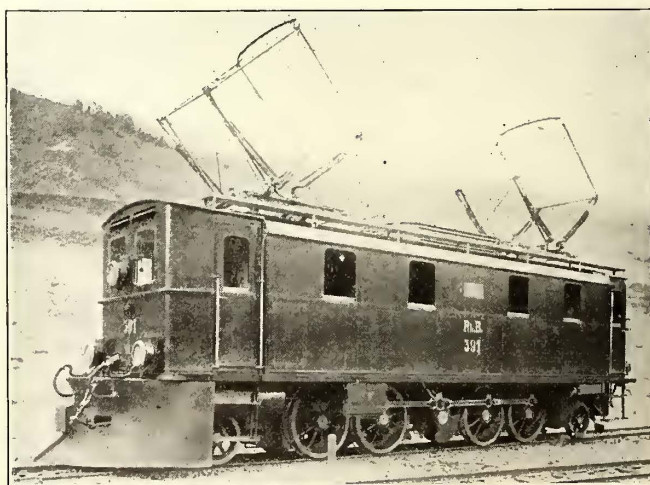
which rises at St. Moritz and Pontresina to 5870 ft. above the sea level. The electrified lines, which are single-phase at sixteen and two-thirds cycles and 10,000 volts to 11,000 volts, begin at the towns named and end at Schuls, in the Lower Engadine, at an altitude of about 3940 ft. Their total length is 39 miles and their maximum grade is $2\frac{1}{2}$ per cent.

The trains are hauled by locomotives, one of which has been supplied by the Allgemeine Elektrizitätsgesellschaft, Berlin, Germany, as hereinafter described. The mechanical part was built by the Schweizerische Lokomotiv und Maschinenfabrik, Winterthur, Switzerland. A preliminary description of this machine appeared in the ELECTRIC RAILWAY JOURNAL, page 273, Jan. 31, 1914.

The locomotive, which is destined for both passenger and freight service, must be able to haul in continuous service trains having a total weight of 200 metric tons maximum. The maximum tractive effort at the circumference of the driving wheels has been fixed at 19,030 lb. As the admissible axle pressure is only 11 tons, it was necessary to provide the locomotive with four coupled axles and two running axles. The maximum speed is 27.9 m.p.h. The locomotive has two motors of an hourly rating of 350 hp each. Both motors have pinions on each side which mesh into a common gear. This shaft is connected by inclined connecting rods to a jackshaft between the second and third of the coupled axles. The teeth of the two pinions of each motor are cut obliquely in opposite directions to equalize stresses.

MOTORS AND TRANSFORMERS

These motors are designed to start as repulsion machines with short-circuited commutators. After the rotor has reached a certain speed, the short-circuit is



Rhaetian Railway—Single-Phase Locomotive of 700 HP.

opened and the motors continue to run. The independent feed of the rotor and the stator windings at different pressures is secured by means of an auto-transformer. The latter is permanently connected in

shunt with the entire winding of the motor. The ratio between the pressures supplied to the rotor and stator respectively is regulated by the engineer in accordance with the speed as shown by the speed indicator. The locomotive can be driven also by one motor alone should the other be damaged. For this purpose each motor can be easily disconnected without any possibility that self-excitation will follow because of the idle rotation.

The main transformer, combined with the auxiliary transformers and the choke coils, is submerged in oil. The oil casing has copper ribs which permit most efficient cooling. The oil switch has four contacts. The two contacts which close the circuit before the others

CONTROL

The control is effected by electromagnetic contactors, the coils of which are fed with single-phase current at 300 volts. The accompanying diagram of connections shows the different functions of these contactors. The twelve contactors used for the "power-control" connect the terminals D_2 and D_1 of a choke coil with taps T_1 to T_{12} of the load transformer. Tap D_1 of the choke coil feeds the motors at pressures lying between any two adjacent steps, T_1, T_2, T_3, T_4 , etc., the contactors of which have just been closed. To vary the motor voltage, these contactors are opened and closed alternately. Interruption of the current is avoided because at least one con-



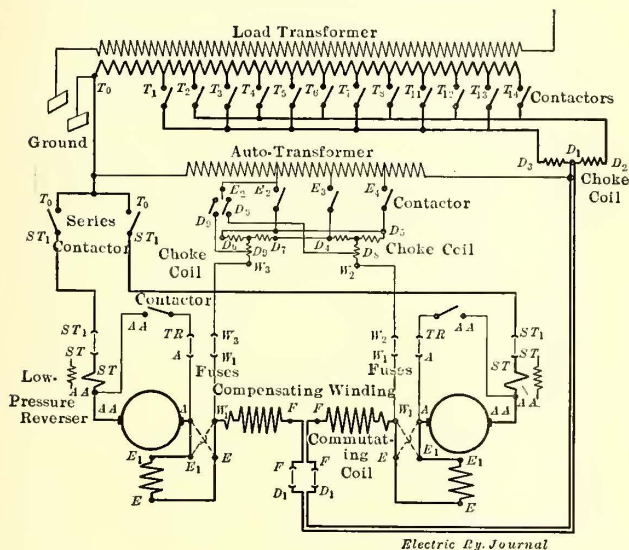
Rhaetian Railway—Light Steel Catenary Bridges at Schuls-Tarasp Station

are connected in series with an ohmic resistance to protect the transformer from rushes of current at the instant when the oil switch is closed. The switch can be operated from either cab by direct mechanical or

factor is always closed. A second kind of contactor is used to vary the voltage ratio between the rotor and stator. For this purpose, taps E_2 to E_4 of the auto-transformer are connected with W_2 and W_3 of the motors. Two further contactors are used for short-circuiting the rotors during the starting period. The two reversers which control the direction of running are also operated with 300 volts alternating current. Finally, two "series" contactors T_0 and St are used, first, to get a double interruption of the motor circuit and, second, as a safety precaution against incorrect operation and involuntary starting.

The contactors are operated from the controllers in the cabs. These controllers resemble the usual car controllers. They consist of a main cylinder for the control of the "power" contactors and an auxiliary cylinder for the control of the reverser, the voltage regulation and the short-circuiting of the rotors. The two cylinders are locked against each other in the usual way, so that a change of the direction of running can be effected only when the circuit has been opened.

All contactors are provided with auxiliary contacts so that wrong connections will not be made, say when a contactor remains in the "on" position when it should be "off," in which case the transformer or other apparatus could be damaged. The reversers also possess auxiliary contacts which allow the "series" contactors to close only when both reversers are set for the same direction of running. Finally, the "series" contactors include auxiliary contacts to avoid starting the locomotive when the controller has been left on one of its operating positions instead of the zero position.



Rhaetian Railway—Control Diagram of Single-Phase Locomotive

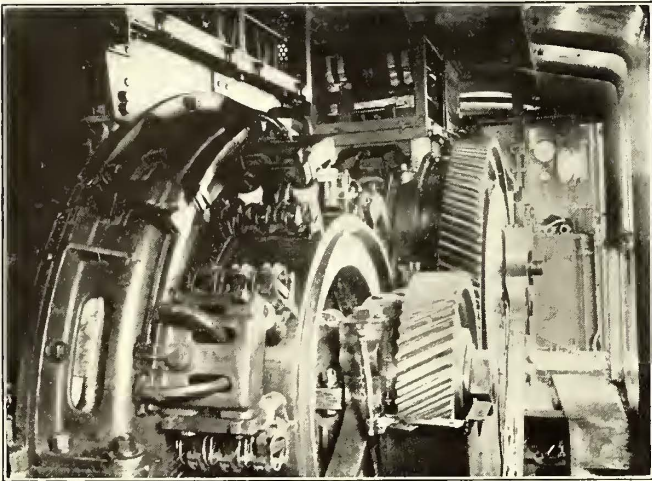
indirect electropneumatic transmission. The switch opens automatically on overloads. For purposes of inspection the oil casing can be lowered by a winch.

CURRENT COLLECTION, BRAKES, ETC.

Current is collected from the overhead line by means of two pantographs with aluminum bows. These collectors are designed for a height of the contact wire varying between 13.6 ft. and 20.7 ft. and operate with compressed air. One motor-compressor produces the air pressure for this purpose as well as for the electro-pneumatic control of the oil switch, the signal whistles and the sander.

The locomotive is equipped with the Hardy vacuum brake. A special controller in each cab is used to operate an electrically driven vacuum pump, which produces the necessary vacuum for the operation of the brake. In the braking position the controller operates an air slide valve mechanically. The locomotive is lighted by direct current produced by a converter group the shaft of which also carries a fan ventilator for the ventilation of the apparatus room. The d.c. generator of the group works in parallel with a battery and is controlled by an automatic regulator to avoid overloading of the battery.

The high-tension apparatus is inclosed in a compartment the doors of which are so interlocked pneu-



Rhaetian Railway—Interior of Locomotive with the Gear Drive Exposed

matically with the current collectors that they can be opened only when the collectors are lowered.

Reports received by the Allgemeine company up to March 1 showed that this locomotive had then run about 18,600 miles in trial and regular service without developing any appreciable defects. The average wear of the brushes was about 1 mm per 10,000 km (approximately 0.064 in. per 10,000 miles). No contacts have required replacement. At the severe trial runs the locomotive complied with all the specified conditions. A train of a total weight of 180 tons attained an average acceleration of 0.557 m.p.h.p.s. on a 2 per cent grade.

A FOREIGN VIEW OF AMERICAN ELECTRIFICATION

Philip Dawson, electrical engineer of the London, Brighton & South Coast Railway, gave an illustrated talk before the employees of that company at London Bridge Station, London, on Wednesday, March 11. This lecture was based on a recently completed six months' tour of inspection of American and European electrifications.

Mr. Dawson said that so far as the electrification of main-line railways was concerned progress in Europe had been quite as rapid as in America, as shown by the fact that at present there were in Europe more than 2000 miles of electrified main-line single track

over which some 300 electric locomotives were operated, figures practically as high as any to be found in the United States. This, of course, did not take into consideration the interurban development of the United States. Although the extent of railway electrification was practically the same in Europe and in America, there was a great difference in that far longer stretches of individual lines were electrified in America. Thus the New York, New Haven & Hartford Railroad had electrified nearly 600 miles out of New York. The two freight yards at the Harlem River terminal, New York, were of particular interest to him. These yards have 60 miles of electrified track and in the month of November, 1913, they handled 65,000 freight cars, or about 1,250,000 tons. The work in these yards was of an excessively heavy character and consisted chiefly of unloading flat-bottomed barges or lighters. The chief inspector in charge of the yard told him that he had been thirty-five years in the service of the company, and that if it was to go back to steam haulage he would quit, as he found electricity safer, more speedy and more reliable than steam. The freight manager of the Harlem River yard also told him that in one case when it was necessary to go back to steam for a few days on account of alterations twice as many steam locomotives were required to do the same amount of work. One electric switching locomotive had worked continuously for twenty-four hours a day for forty-six days, working with three shifts of men.

The maintenance of American steam locomotives varied according to types and cost from 10 cents to 20 cents per locomotive mile, whereas the electric locomotives throughout America varied in maintenance cost from 3 cents to 5 cents per locomotive mile. G. W. Wilden, mechanical superintendent of the New Haven system, had informed him that as an average for general railway work, such as that of the New Haven system, six to seven electric locomotives would do the work of ten steam locomotives and that the maintenance costs were about half of those of steam.

Mr. Dawson then described the work done by the Pennsylvania Railroad at New York and on Long Island. He observed further that for the single-phase system to be used in the Philadelphia suburban electrification 90 miles of single track would be electrified and that 120 motor cars were on order. After brief references to the Baltimore & Ohio, Hoosac and Michigan Central tunnel electrifications, Mr. Dawson discussed the Sarnia tunnel of the Grand Trunk system. The electrification of this tunnel had given very satisfactory results. For steam, the cost per car handled had amounted to 27 cents, whereas the cost electrically was little more than 16 cents. The total number of passenger and freight cars handled in one year with six electric locomotives was 320,000, or about 12,500,000 tons. This electrification amounted to 12 miles of single track.

Mr. Dawson also visited the Butte, Anaconda & Pacific Railway, which, he said, Americans called the "biggest little railway in the world." The standard trains weighed 2400 tons and were hauled up 1 per cent grades. Mr. Galloway, the general manager, informed him that the electric locomotives handled 25 per cent more weight at 50 per cent higher speed and saved 25 per cent in operating expenses as compared with the steam locomotives used hitherto. The speaker also referred to the Spokane Inland Railway and the electrified lines of the Southern Pacific system at Oakland.

In conclusion, Mr. Dawson mentioned the electrification work accomplished or under way on the Continent. The two largest installations of the Prussian State Railways were that between Leipsic and Magdeburg, a

distance of 100 miles, and that between Lauban and Königszelt, 81 miles of route in the mountain district of Silesia. The total track mileage electrified by the Prussian State Railways, including the suburban system at Hamburg, amounted to nearly 400 miles, over which 120 motor cars and 100 electric locomotives were operated. As to France, the Midi Railway was to electrify about 550 miles of the track on which seventy-three electric locomotives and fifty-four motor cars were to be used. In Italy, he was informed at Genoa by the chief engineer of the Italian State Railways, that the three-phase locomotives did three times the mileage of steam locomotives at no greater cost. Two of these locomotives, one in front and one behind, handled 380-ton trains at 27 m.p.h. on grades of more than 3 per cent. The financial results of electrification have been so satisfactory that the Italian government now had in contemplation the electrification of nearly 1500 miles more.

At the end of the lecture Mr. Dawson answered a number of questions put to him by his auditors.

JOINT NATIONAL COMMITTEE ON ELECTROLYSIS

The second regular meeting of the joint national committee on electrolysis was held in the rooms of the American Institute of Electrical Engineers in New York on Feb. 25, 1914. The minutes of the meeting have just been made available by the committee. The meeting was attended by B. J. Arnold, temporary chairman; Calvert Townley, E. B. Katté, H. S. Warren, D. W. Roper, F. N. Waterman, A. F. Ganz, W. J. Broder, A. S. Richey, Philip Torchio, L. L. Elden, Forest Towle and Paul Winsor. This joint committee was formed at the suggestion of the American Institute of Electrical Engineers at the instance of Calvert Townley. In the issue of the *ELECTRIC RAILWAY JOURNAL* for May 24, 1913, page 934, an announcement was made of the preliminary plan, which included representation by all interests involved. The purpose of the formation of the committee was to agree upon some basic principles or method of procedure to be followed in the case of electrolytic disputes.

An account of the first meeting of the committee, on May 27, was published on page 1025 of the issue of this paper for June 7, 1913. At this meeting several interests were not represented, and it was decided to effect only a temporary organization until the cooperation of all could be secured. R. D. Mershon, who was at that time president of the American Institute of Electrical Engineers, called the meeting to order, and B. J. Arnold was elected temporary chairman. A preliminary organization was effected and this was made permanent at the meeting held recently.

In order that the work of the committee could be laid out and a definite plan of action decided upon, the following appointments to a committee on plan and scope were made: Calvert Townley, chairman, representing the American Electric Railway Association; E. B. Katté, representing the American Railway Engineering Association; H. S. Warren, representing the American Telegraph & Telephone Company; D. W. Roper, representing the National Electric Light Association; F. N. Waterman, representing the American Institute of Electrical Engineers; A. F. Ganz, representing the American Gas Institute, and W. J. Broder, representing the Natural Gas Association of America.

At the request of the chairman, Mr. Townley gave the following outline of the general scope of the committee for the benefit of those represented who had been recently appointed:

"Electrolytic controversies have in the past given

rise to unnecessary and acrimonious disputes and not infrequently have resulted in litigation between the corporations concerned. The usual procedure in disputes of this kind has been for each side to employ one or more electrical experts, who generally disagree as to the cause of the trouble and the remedies therefor. The dispute sometimes gets into the newspapers, occasioning unpleasant notoriety and resulting in more or less drastic action by the city government concerned. Much of this could be avoided if a body such as this committee could be created which would consider broadly the questions covered by the controversy, without attempting to pass upon the questions at issue, the members to report back to their respective organizations so that in time the committee would become recognized as a neutral body whose decisions would be authoritative, just as is the standards committee of the American Institute of Electrical Engineers in connection with matters of definition and standardization. With that end in view the Institute initiated the movement to organize a national body to consider the general subject and agree upon any basic principles or methods of procedure to be followed in the case of electrolytic disputes. Now that the organization of such a body has been accomplished, it remains for the committee to determine what lines of action to take." Mr. Townley then said that in correspondence with different people he had found that the purpose of the committee was frequently misunderstood, the impression prevailing in some quarters that it was to act as an arbitration board in controversies, telling what ought to be done and thereby taking the places of executives or of the court.

The third meeting of the joint committee was held in the rooms of the American Electric Railway Association on Feb. 26, 1914. It was announced that the Bureau of Standards would be officially represented in the committee by Dr. E. B. Rosa, and he was appointed secretary of the joint committee and a member of the committee on plan and scope.

The committee on plan and scope presented a preliminary report resulting in the adoption of the following resolution: "Resolved, that the chairman be authorized to appoint committees as informally recommended by the plan and scope committee to collect information as outlined in the report and that the committee on plan and scope be continued and requested to report further at the next meeting of the joint committee."

As at present constituted the joint national committee on electrolysis consists of the following representatives of their respective organizations: American Electric Railway Association—R. P. Stevens, A. S. Richey, Calvert Townley; American Railway Engineering Association—E. B. Katté, D. J. Brumley, W. I. Trench; National Electric Light Association—Philip Torchio, L. L. Elden, D. W. Roper; American Telephone & Telegraph Company—H. S. Warren, F. L. Rhodes, A. P. Boeri; American Institute of Electrical Engineers—B. J. Arnold (chairman), F. N. Waterman; National Bureau of Standards—E. B. Rosa; Natural Gas Association—B. C. Olyphant, Forest Towle; American Gas Institute—A. F. Ganz, J. A. Gould, Jacob D. von Maur.

Before the adjournment of the third meeting, Chairman Arnold announced the appointment of the following committees: On principles and definitions—Messrs. Rosa (chairman), Brumley, Stevens and Boeri; on methods and analyses of surveys—Messrs. von Maur (chairman), Olyphant, Elden, Rhodes and Winsor; on foreign practice—Messrs. Torchio (chairman), Towle, French, Townley and Gould; on domestic practice—Messrs. Waterman (chairman), Broder, Ganz, Roper, Richey, Katté and Warren.

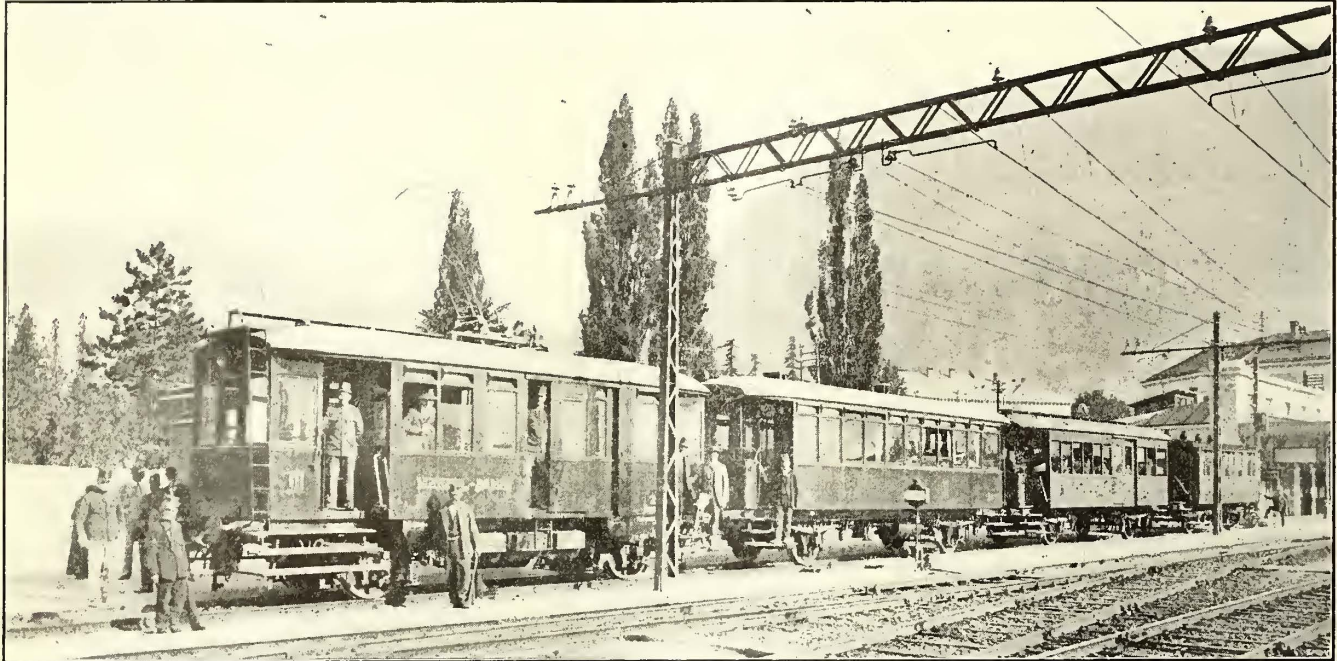
The 1200-Volt D.C. Ueberetsch Railway

This Is a Standard Gage Railway in the Southern Tyrol Near Bozen, and Is the First Austrian Railway to Be Equipped with Straight 1200-Volt D.C. Motors—Part of the Line Was Changed from 650 Volts and Part Was Changed from Steam

BY WILLIAM C. GYAROS, ELECTRICAL ENGINEER, BUDAPEST, HUNGARY

The Ueberetsch Railway connects the town of Bozen with the lower end of the fine cable railway of the Mendel ridge, which within one sweep of 1.4 miles overcomes a difference in elevation of more than 2600 ft. to reach the Mendel Pass at a height of 4500 ft. above

with 650 volts only. Immediately after the opening of this section, plans were proposed for the electrification of the complete line, but for several years no decision was reached because electrification did not show the desired economies. However, in the year 1910, the



Ueberetsch Railway—Passenger Train Under Catenary Bridge Construction at Bozen

sea level. The magnificent panoramic view afforded from this height, commanding the Dolomitic Alps, renders the Ueberetsch Railway one of the most important tourist routes in the neighborhood. The Ueberetsch region of southern Tyrol is also famous for its excellent red wine. The total length of the Ueberetsch Railway is 10.7 miles. The line is of standard gage and single track throughout. It uses 52-lb. rails on the upper sections, and 69-lb. rails on the 2.8-mile section operated jointly with the Bozen-Meran Railway. The Mendelbahn* or end section has a maximum grade of 6.2 per cent with an average of 5.8 per cent, while the middle or Ueberetsch section has a 3 per cent grade for $3\frac{1}{2}$ miles.

The daily time table contains from nine to ten mixed passenger and freight trains and from one to two freight trains. The train weight varies from 35 to 52 metric tons for the mixed trains and from 50 to 80 tons for the freight trains, motor car included. The maximum speed of the trains amounts to about 28 m.p.h. on the jointly-operated section with 1 per cent grade, to between 14 m.p.h. and 22 m.p.h. on the Ueberetsch line proper, and to between 10 m.p.h. to 13 m.p.h. on the Mendelbahn section. The sharpest curve is about 400 ft. radius.

OLD AND NEW ELECTRIFICATIONS

The Mendelbahn section was electrified in 1904, but

*The Mendelbahn was described in the STREET RAILWAY JOURNAL for April 2, 1904.



Ueberetsch Railway—Combined Substation and Residence at Etschwerke

Austrian Ganz Electric Company, Ltd., Vienna, made a satisfactory tender based on the use of 1200 volts direct current, including the change of the Mendelbahn section to the higher voltage. At that time 1200 volts was a record in both Austria and Hungary, and it still holds

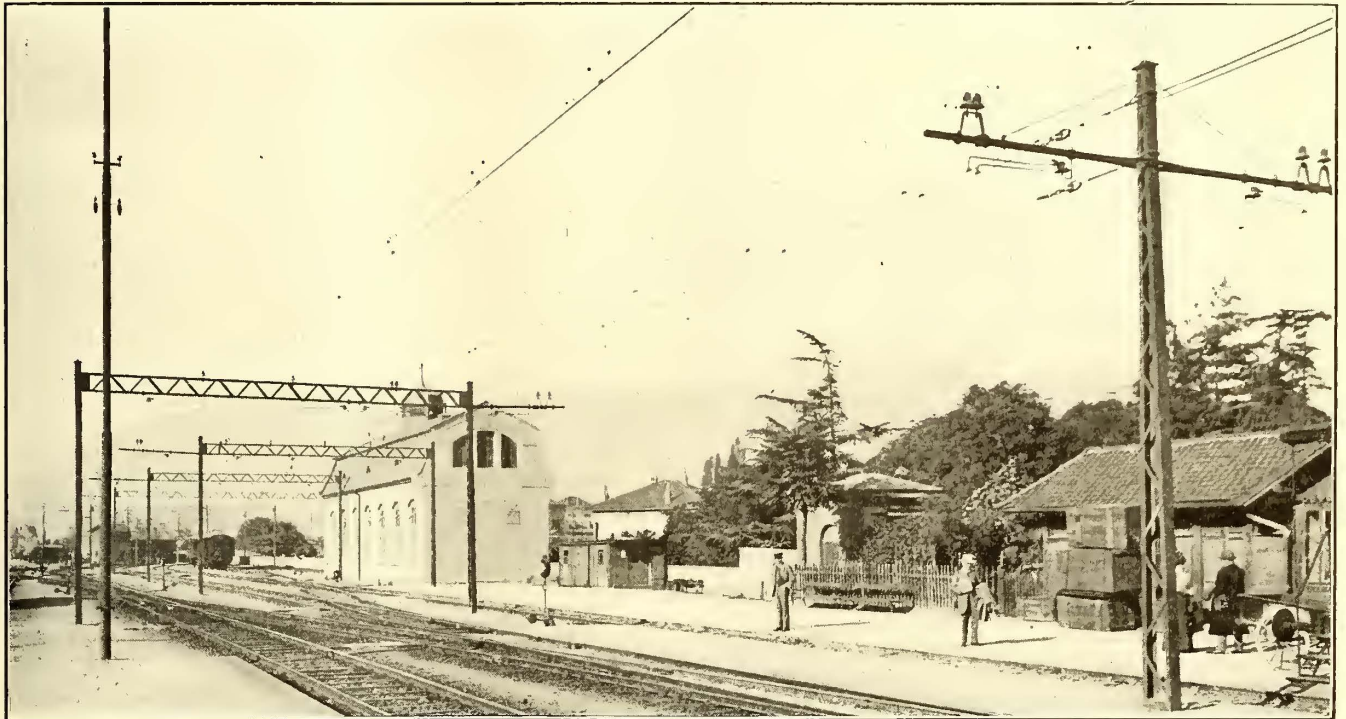
the record in the former country. The height of the voltage is of particular importance because the motors are wound for the whole line potential instead of being used two in series.

The 1200-volt direct current is produced in the substation at Eppan, which lies pretty nearly at the center of the whole line. Energy is derived from the transformer substation of the Etschwerke, a local hydro-electric plant. The Etschwerke transformer substation furnishes three-phase power at 10,000 volts and forty-six cycles over a cable about 3000 ft. long to the Eppan substation. The latter, by means of four separate feeders, supplies 1200 volts direct current to four sections of the railway.

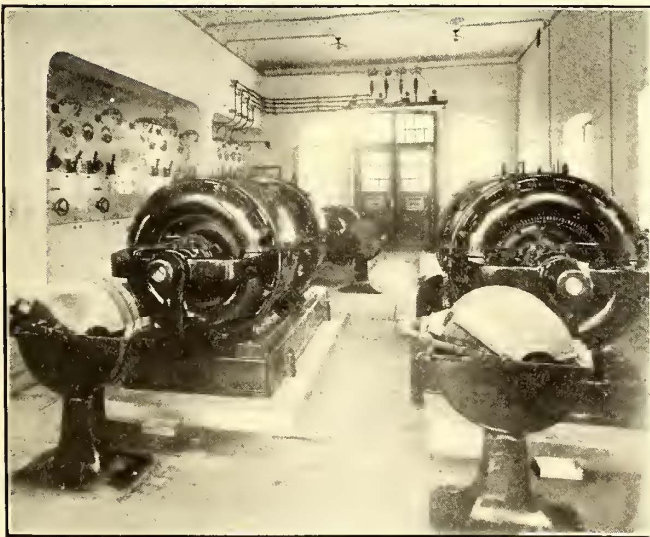
located on the upper floor. The high-tension apparatus and the connections of the 10,000-volt transmission cable terminals are in the basement underneath the transformer room.

The 10,000-volt high-tension switching apparatus is located within fireproof compartments. The oil switches are operated by means of chain drives from the switchboard in the machine room above. The oil switches have automatic break with time-limit action for overload, the respective low-voltage relays being situated on the front of the switchboard panel above, together with red and green signal lamps which show the position of the switches.

The high-tension three-phase current is taken from



Ueberetsch Railway—Lattice Pole and Bridge Catenary Suspension at Bozen



Ueberetsch Railway—Interior of Substation at Etschwerke
SUBSTATION

The handsome substation shown contains the ground floor, the machine room, transformer room, stores, repair shop and one-half of the storage battery, while the other half of the battery and living apartments are

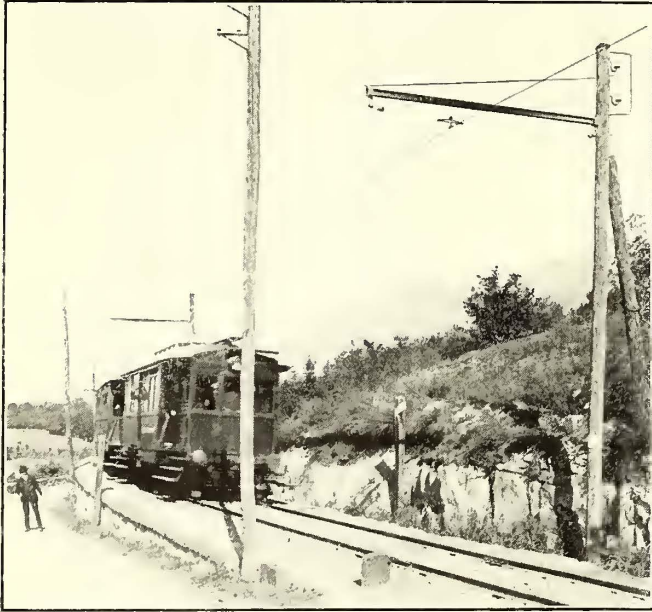
located in the basement to the transformer room through high-tension cables. Two transformers of 220 kva each are provided, one for each motor-generator set, to step down the tension from 10,000 (or 20,000) to 500 volts. The low-voltage three-phase power is carried to the machine room by means of bare copper wires carried on porcelain insulators.

The machine room contains two motor-generator sets, one of which serves as a spare, and an automatic reversible battery booster. The motor of the motor-generators is of the induction type and is directly coupled to a 1200-volt commutating-pole d.c. generator of 140-kw output at 900 r.p.m. Each set has three ring-lubricated bearings, the coupling between the motor and generator being rigid. The booster is of the Pirani type and consists of a 500-volt three-phase induction motor and a double-commutator generator built for a normal output of 260 amp at 120 volts and 1340 r.p.m. The two commutators work in parallel for boosting the battery for line work, and in series for battery charging.

The switchboard has eleven panels of white marble and is provided with insulated platforms in front and behind. The iron framing of the switchboard carries all apparatus and measuring instruments for both 500-volt three-phase and 1200 volt d.c. energy. The switchboard contains only the handles of the chain drives for the oil switches, and the low-tension measuring and

signaling apparatus. The 500-volt and 1200-volt apparatus are arranged behind the panels, and only their grounded handles project on the front. The 1200-volt measuring instruments are protected against contact by grounded covers.

The 500-volt switches for the three-phase induction motors are of the oil-immersed type. The 1200-volt switches for the generators, battery and feeders are of



Ueberetsch Railway—Bracket Construction Along Highway

the air-break magnetic blow-out type. These switches have a single break and solid contacts, and are built like motor-car contactors. There is an automatic circuit-breaker and a negative switch for each generator, and a circuit-breaker and a hand-break switch for the battery and for each feeder.

The switchboard also carries all exciter rheostats, and two four-pole commutating switches for the reversible booster. The totalizing panel contains an ammeter for the total outgoing current and an integrating wattmeter for the total line power. The substation apparatus is completed by four lightning arresters with respective choke coil and ground resistance, one set for each outgoing feeder; these are located on a frame above the entrance door.

The storage battery consists of 577 Tudor cells for a one-hour discharge capacity of 259 amp-hours. That half of the battery which is on the higher potential is provided with better insulation throughout, beside which a wooden lattice fence fastened to insulators is installed to protect the attendants from shocks which they might receive if they touched simultaneously the wall and any live part of the cells. A knife switch is inserted in the conductor which connects the battery halves, and by means of this the halves may be separated and the battery potential halved for any work on the battery, thus decreasing still further the danger of shocks to the attendants.

LINE CONSTRUCTION

The trolley line consists of an 80 mm² (about 160,000 circ. mils) grooved hard-drawn copper wire, with the exception of the Mendelbahn section, on which the existing double trolley of two circular wires of 50 mm² (about 100,000 circ. mils) and of the Kaltern station, where the 100,000 circ. mil overhead wires were kept unaltered.

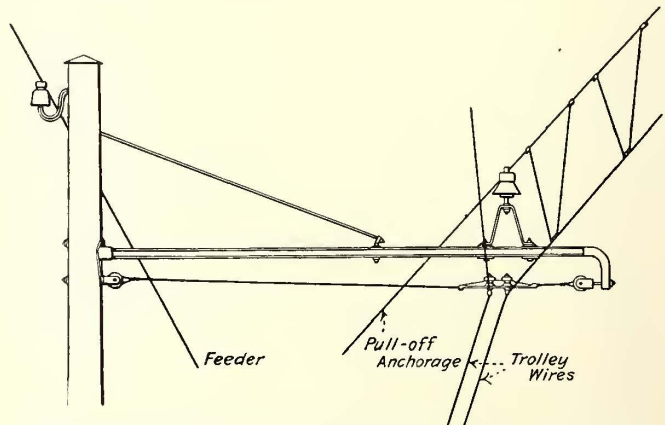
The suspension of the trolley wires on the Mendel-

bahn section had been of the span-wire type, on bracket poles of wood. The suspension was not changed, but the insulation was increased by the introduction of a special insulating pin in the hanger insulator and of powerful porcelain strain insulators at the ends of the span wire. The same method of suspension and of insulation was used on the middle section, with the sole difference that the type of bracket shown was adopted. Substantially the same suspension is used in the tunnels and in the stations.

On the jointly operated section the authorities demanded a catenary suspension for the trolley wire and the Fischer-Jelinek system was adopted. This system has been used successfully on other similar railways, among others on the Budapest Local Railways. It is a catenary suspension with automatic trolley tension regulation.* The tension regulation is secured by weights attached to the ends of the trolley wire which are conveniently sectionalized every 3000 ft. to 4000 ft. The novel means for obtaining a movable trolley wire in connection with a rigidly supported messenger cable consists in the use of clamps which do not grip the trolley wire tightly, but fit loosely into the groove of the wire and thus allow the wire to slide through the clamp. To prevent it from traveling along with the trolley wire, the clamp is hung from the messenger by two wires running up obliquely from it in the form of the letter V, instead of using only one perpendicular wire. In this way the suspension system secures free play to the trolley wire without the auxiliary messenger wires used in other systems.

Bracket poles of wood are used on this section except at Bozen station, where it has been found more convenient to use steel lattice girders, which span several tracks. Steel poles are used at pull-off points.

The messenger is a seven-strand steel cable of 34.5 mm² (70,000 circ. mils) section, mounted on a double petticoat clock-shape porcelain insulator, which carries an upper petticoat of tin as a protection against mechanical injuries. A second insulation is provided by a "stabilite" bushing around the lower end of the insulator pin. On each bracket a steadying arm is ap-



Ueberetsch Railway—Bracket Pole with Both Span and Catenary at Transition Point

plied to hold the trolley wire in line above the track, which is insulated by the same kind of insulator as the messenger.

The feeder wires are carried on the same poles as the trolley wire, on separate double petticoat porcelain insulators. Copper wires of 50 mm² (about 100,000 circ. mils) section are used, and connected in multiple, where required.

*See ELECTRIC RAILWAY JOURNAL, June 1, 1912, page 911.

The trolley line is divided into four parts by suitable section insulators. The four stations of Bozen, Eppan, Kaltern and St. Anton and a few sidings are also separated from the main line by section insulators. The separate sections are fed over sectionalized switches. At least one lightning arrester is installed in each section. The tracks are bonded by protected copper rail bonds of about 170,000 circ. mils section; cross bonds of a similar section are used every 330 ft., as well as bridging wires at switch points, to insure continuity of the track circuit.

ROLLING STOCK

The rolling stock consists at present of four passenger motor cars and a number of passenger trailers. During the vintage season extra freight is handled with borrowed steam equipment. The motor cars serve for freight trains as well as for passenger trains, and have a service weight of 17.5 metric tons, without load. They have two radial axles instead of trucks, and 1000-mm (about 40-in.) wheels. There are twenty seats in two compartments per motor car, beside standing accommodation for fifteen persons and for a baggage compartment. The over-all length of the motor cars is about 9.50 m (31 ft.).

The electric equipment consists of two 85-hp motors, geared 1:4.5, built for an average of 1100 volts and running at 560 r.p.m. at the hour rating. The motors are wound for the full line potential, and until recently they held the record for brush voltage in Austria-Hungary. They have been surpassed very recently by motors for the Tatra Railways, furnished by the Budapest Ganz Electric Company, which are wound for the full line voltage of from 1650 to 1700 volts.

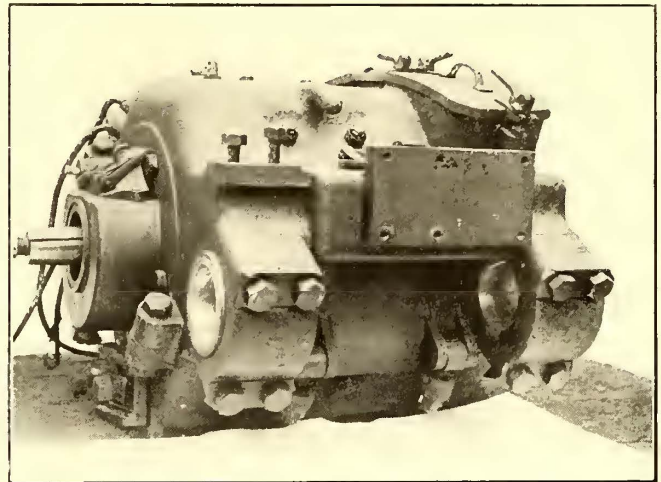
The motors have commutating poles and diagonally split cases but no artificial ventilation. The bearings are in circular shields which are large enough to allow the armatures to be rolled on the floor without coming into contact with it. The armature bearings are of the ring-lubricated type and have satisfied all expectations. The axle bearings have drop feed lubrication, as it would have been very difficult to apply the ring construction to them.

The multiple unit control employed is based on the series-parallel system. It consists of eleven electromagnetic contactors, a reversing switch, two master-controllers and a couple of converters with accessories to furnish the low voltage auxiliary current for the control system. Furthermore, the apparatus includes an automatic circuit breaking relay, one safety fuse box, a motor cut-out switch, the starting resistances, a lightning arrester and a pair of bow collectors. The eleven contactors and the reverser are located underneath the car underframe. The contacts of the contactors are of solid copper, making contact with a slight rubbing motion. The actuating solenoid and the blow-out coil are on the back. The reverser is a contact drum revolving between two rows of contact fingers under the action of two solenoids, one for each running direction. The contactors and the reversing switch are controlled from the master controllers placed on the platforms.

The master controller consists of two cylinders, one for reversing, the other for the series-parallel control. The operation of this master controller shows some interesting points. The main cylinder, namely, that for the series-parallel points, is connected to a strong coil spring, which tends to bring it back to its initial position. The main handle, instead of being applied directly to the shaft of the main cylinder, actuates a ratchet mechanism, by which the main cylinder can be moved forward by one point every time the main handle is swung forward through an angle of about 30 deg. Thus

the full series of starting points is accomplished by ten pairs of forward and backward swingings of the main handle. This ratchet action achieves the same end as the various controller regulators inasmuch as the motorman is prevented from making excessively rapid starts. In the running position, the handle rests against a slightly raised stop in the top of the controller, so that the weight of the motorman's hand suffices to hold it there. For switching off the current the motorman has only to release the handle, when it will be swung backward by a spring which exceeds the resistance of the stop previously mentioned, thus freeing the ratchet mechanism and allowing the main cylinder to return to its initial position. In this way, the arrangement embodies also the features of the "dead man's handle."

The circuit-breaking relay is a solenoid inserted into the main circuit. Above a certain maximum current value this relay will open a contact and interrupt the control current. A voltage coil upon the same magnet core is placed under current in the "out" position of the relay and fixes the relay there until the master controller is brought back into its initial position. The safety fuse box has a horn air gap combined with a powerful magnetic blow-out action. The motor cut-out



Ueberetsch Railway—1200-Volt D.C. Motor

switch is a contact drum between two rows of contact fingers and needs no further description. The control current converter is a small machine of about 500 watts output with two independent armature windings and two commutators, one for 600 volts and the other for 100 volts. The field is excited from the 600-volt side. A permanent resistance is inserted in series with the armature, as it is essential that the converter may be cut in instantaneously. Two of these converters are connected in series across the line potential; they are combined with a separate cut-out switch, by which one of the two may be thrown out of circuit in case of failure and replaced by a conveniently connected resistance in such a way that operation might be continued with the remaining converter.

The lightning arrester is located on the roof. It consists of a horn air gap with magnetic blow-out combined with a carborundum grounding resistance. The two current collecting devices are of the well-known Siemens type and have aluminum sliding contact bows. Two are used to secure a safe sparkless contact at a comparatively light trolley pressure. A common hemp trolley cord is used, and no special insulator is used with it as that was found unnecessary at the line voltage employed.

The electric lighting of each motor car consists of

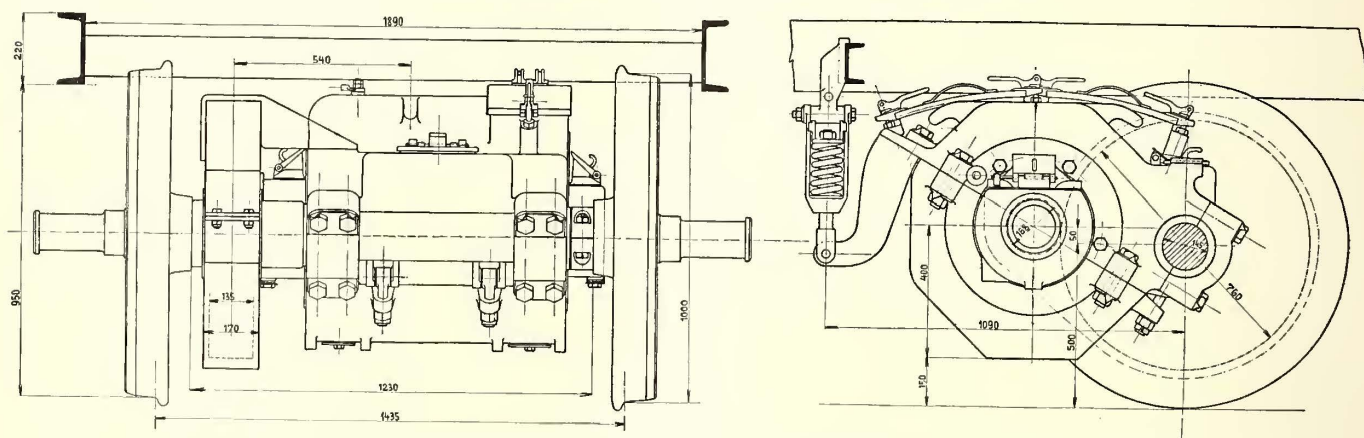
ten 25 cp, 120-volt lamps connected in series, of which four (in pairs) are used in the headlights, two on the platforms, the rest inside. The lampholders as well as the lamp sockets are of special construction to enable them to stand the full line pressure appearing at the lamp terminals in case of lamp failure. The lamp socket is entirely enclosed in an insulating cover. The heating is done by "Electra" type heaters, of which three of 600 watts each are used in series in one circuit. The main fuse for the lighting and heating circuits is applied on the roof of the car and consists of a fuse strip strung across a horn gap; porcelain-encased plug fuses are used for the separate circuits.

The motor cars are equipped with automatic vacuum brakes and eight brake shoes. The air pump is driven by a high-tension d. c. series-motor; motor and brake are controlled by a combined controller and brake valve. Besides the vacuum brake a very powerful hand brake is provided because of the heavy grades on the system. For signals a signal bell and a signal horn may be used; the latter is actuated by the exhaust of the air pump.

The trailers are similar to the motor cars but are of greater length, relatively lighter construction and have

pense required to keep the underground conduit railway in operating condition. The initial high cost of conduit is not its only objection. The conduit must be constantly cleaned, as all sorts of objects fall through the slot in spite of the fact that the slot is only $\frac{7}{8}$ in. wide.

According to T. F. Mullaney, chief engineer Third Avenue Railway, broken automobile chains cause a great deal of trouble on the lines of that company when they find lodgment in the conduit. The first intimation of trouble from such a cause is a short circuit or ground on the system, when one of these chains comes in contact with the conductor rail or with the plow of a car. But automobile chains are not the only metal objects which pass from the street into the conduit to cause trouble to the railway operator. Iron hoops from barrels, baby carriages, etc., pieces of wire, bolts, horse shoes, mud, snow and débris of every kind seem to be attracted to this place. Recently on the Amsterdam Avenue line of the Third Avenue company a car came to a sudden stop, and it was found that a $\frac{3}{4}$ in. steel cable 28 ft. long had in some way slipped through the opening in the street and had become entangled in the plow of the car. Some time ago on the Third Avenue line quite a few steel rods fell from a passing truck into the con-



Ueberetsch Railway—85-Hp, 1200-Volt D.C. Motor for Standard Gauge (Dimensions in Millimeters)

open platforms. They generally contain fifty seats, of which twenty are first-class and thirty are third-class. The lighting and heating are similar to that of the motor cars, with the chief difference that twice the number of heaters is used in accordance with the greater cubic capacity of the trailers.

MAINTENANCE AND OPERATION

The main car storage and repair shop is at Kaltern station, and is capable of holding five cars. The tools are driven by one 15-h.p. 1200-volt commutating pole d. c. shunt motor at 1200 r.p.m., fed from the trolley line. A plain storage shed for two cars exists at Bozen. The operation of the railway during two and one-half years of 1200-volt service has been most satisfactory. Of particular importance is the very small wear on the motor brushes and commutators, as well as on the ring-lubricated bearings. The success of this first 1200-volt railway in Austria promises well for further developments in this direction, and it is to be expected that high-tension d. c. railway construction will make further progress as soon as the present economic depression is over.

DIFFICULTIES OF CONDUIT OPERATION IN NEW YORK

Although visitors to New York see the cars operating regularly on the conduit system, few, even among electric railway men, realize the additional care and ex-

duit, and these became entangled with cars as they passed, with resulting short circuits.

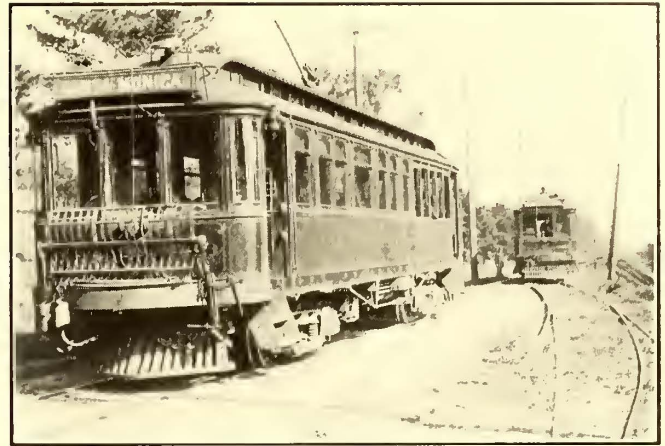
Snow causes a great deal of trouble because of its tendency to drift and fill the conduit. This snow has to be removed by pushing it to manholes by car scrapers and is then shoveled out. These manholes are from 100 ft. to 200 ft. apart and are large enough to receive considerable quantities of snow. During a heavy snow-storm a large force of men has to be engaged on this work constantly, as the manholes must be kept clean. The trouble of cleaning the conduit of snow is enhanced because the manholes are necessarily between or close to the tracks, and it is no easy task for the men to raise the covers and remove the packed snow in a street congested by traffic.

Mischievous persons, particularly boys, also cause serious trouble by attaching a small piece of metal to a string and lowering it through the slot and across the conductor rails, thus causing a short circuit and in some cases tying up the line.

It is no easy matter to locate a ground or short circuit on a system of this kind, as the only way it can be done is practically to examine all insulators, cars, etc. For example, the company finds that a car plow, on a section on which there may be fifty cars, has become short-circuited. There is no way of determining which car causes the trouble except by examination, and the defective plow may be on the last one of the fifty cars examined.



Pacific Electric Motion Pictures—Improper Protection of Passenger Train, by Night



Pacific Electric Motion Pictures—Proper Position of Conductor with Superior Train Entering Siding

MOTION PICTURES ON PACIFIC ELECTRIC RAILWAY

In the issue of the ELECTRIC RAILWAY JOURNAL of March 14, 1914, page 578, an account of the practice of the Pacific Electric Railway in the use of motion-picture films for instruction in rules was given. The accompanying illustrations have been selected by the

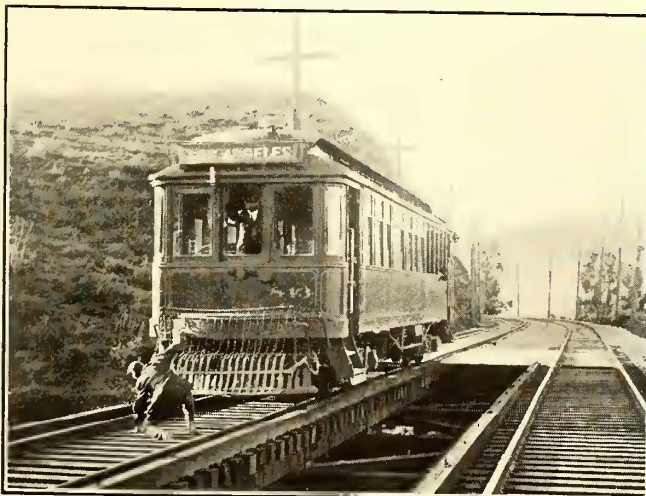
general manager, J. McMillan, from this company's collection to show the general style of the pictures. While it is impossible by means of stationary pictures even to suggest motion, these illustrations indicate the general style followed. The careless inspection of the steam railroad track at an intersection to detect the approach of a train, and the consequence of such careless-



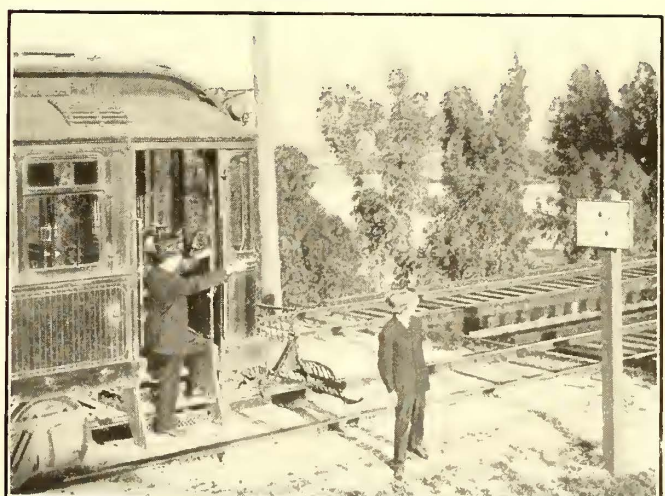
Pacific Electric Motion Pictures—Careless Flagging at Railroad Crossing



Pacific Electric Motion Pictures—Result of Careless Flagging at Crossing



Pacific Electric Motion Pictures—Car Rounding Curve at High Speed Not Under Control, Strikes Trespasser on Narrow Bridge



Pacific Electric Motion Pictures—Car After Rounding Curve Under Control, Stops Before Reaching Bridge and Motorman Calls Attention of Trespasser to Sign

ness are brought out clearly by the pictures. So is the result of failure to have the car under control in a place where, as in the case of a narrow bridge, a pedestrian cannot get out of the way of an approaching car. Courteous warning of a pedestrian who has unwittingly or otherwise broken the rule about trespassing on the company's property is recommended pictorially. The company finds that suggestions can be made to the men in this way which would "go in at one ear and out of the other" if given orally.

DO LOW FARES INCREASE RIDING?

BY IRWIN FULLERTON, GENERAL AUDITOR DETROIT UNITED RAILWAY

For many years city street railway operators in the United States have been informed that a reduction in the rate of fare would not be detrimental to their interests because the increased riding would offset the reduction in the rate, or, in other words, that if the 5-cent fares were reduced to 3 cents there would be so much more riding on the cars that the gap in the gross receipts caused by the 2-cent reduction in fare would be closed. It is sufficient to say that the avenues through which this really marvelous theory of economics has been propounded have not been street railway operators or expert investigators. In the main, this argument has been advanced by organizations or individuals whose knowledge of electric railway matters has been, to treat it kindly, academic rather than practical. The absurdity of the premise as a general proposition will be apparent because if it was followed to its logical conclusion a 2-cent fare should be much more desirable than a 3-cent rate, and a 1-cent fare would be better than either.

Within the last six months the Detroit United Railway has had opportunity to observe the effect of a lower rate of fare upon the riding habit. Since Aug. 15, 1913, under a temporary day-to-day agreement with the city, a seven-for-a-quarter rate has prevailed as the principal fare factor, as compared with a straight 5-cent fare previously. The difference in the rate will be generally acknowledged as sufficient to give a fair test of the theories of the low-fare advocates. What has been the result?

The following table shows the percentages of increase in passengers carried during the last thirteen months over the same months a year ago. The change in fare occurred on Aug. 15, 1913.

TABLE SHOWING PERCENTAGES OF INCREASE IN PASSENGERS CARRIED OVER THE CORRESPONDING MONTHS OF THE PREVIOUS YEAR. DETROIT UNITED RAILWAY

| Month | With 5-Cent Fare Per Cent Increase | Month | With Seven for a Quarter Per Cent Increase |
|----------|---------------------------------------|---------------|---|
| January | 20.53 | †August | 16.03 |
| February | 16.89 | September | 19.42 |
| March | 20.41 | October | 16.41 |
| April | 17.41 | November | 14.65 |
| May | 18.15 | December | 13.39 |
| June | 15.17 | January, 1914 | 12.38 |
| *July | 9.53 | | |

It will be observed that in both January and March of 1913 the percentage of increase was greater than in September, the month which shows the largest percentage of increase in passengers of all since the low-fare agreement has been effective. The average increase for the last four months of 1913 under the lower fare was 15.91 per cent, as against an increase of 19.34 per cent for the first quarter and 16.87 per cent for the second quarter of 1913 under the 5-cent rate. It will also be observed that there has been a steady decrease in the percentage of increased passengers carried in each succeeding month since the low-fare arrangement,

October dropping 3 per cent under September, December 3 per cent under October, and January, 1914, 1 per cent under December.

With these statistics it is exceedingly difficult, in Detroit at least, to reconcile the theories of the low-fare advocates with the results obtained in actual practice. As a matter of fact, the conclusion is inevitable that the average rider on city railways uses the car because he wants to get to some particular place for business or pleasure. If there is any percentage of the public which uses the street car for pleasure-riding purposes or travels simply for the ride, it is imperceptible. If there has been any increase in the short-distance riders because of the lower rate, it certainly is not distinguishable.

It would seem evident that there are factors which affect the riding habit much more than the rate of fare. Industrial conditions and rapid or retarded growth in population should probably be regarded as the most important of these other factors.

There is a phase of the lower-fare more-riders theory which has been either overlooked or disregarded by its advocates, yet it is a phase which has a very important bearing upon the finances of a street railway. If it were true that increased riding followed fare reduction, it is unquestionable that increased transportation facilities must follow, with a consequent increase in cost of operation, and if the gap in receipts between two rates of fare could be equalized by a larger patronage at the lower fare, there must still be taken into account the larger drain upon the treasury caused by the cost of the increased service.

Whether it is really beneficial to the public to have lower fares is a broad question with plenty of arguments on both sides. But it must be recognized that if fares are reduced to such a point as to give a bare margin over operating expenses, street railway companies will not be able to provide the service which they could supply under more favorable fare conditions. Sometimes cheap rides are not economical for the public, and it is reasonable to believe that the individual rider will be better off in the end if he forgoes the small saving which he might make under a lower rate of fare and places the quality of service as the first consideration in his mind. So long as the product of the street railway company has a fixed price and its expenses work on a sliding scale with the trend continually upward, it is a mathematical certainty that the public cannot receive more than it pays for.

JUSTICE FOR THE RAILROADS

"Starve the Railroads and We Starve Ourselves" is the title of a recently issued reprint from an article by Frank A. Munsey in the April, 1914, issue of *Munsey's Magazine*. The railroads, Mr. Munsey points out, were built by private capital and are owned by private capital, yet they have little of the inherent freedom of private property. The amazing development of railroads has necessitated the establishment of government control. The exercise of this control, however, has, frightfully crippled and maimed the entire railroad business of the country, producing a condition picturesquely characterized by the author as a "blue funk," manifesting itself by business depression and industrial starvation. Re-establishment of business can only be brought about, Mr. Munsey believes, by the impetus of advancing railroads freight and passenger rates that will enable them to do business at a rational and fair profit. Then, and not until then, will the confidence of investors be restored, money will flow into railway securities, railroads will begin buying again, and the country electrified into industrial action again.

*July, 1912, was Cadillacua month and traffic was above normal.
†Fifteen days in August were under 5-cent fares.

Fare Dispute in Toledo

Complications Over the Termination of Franchises Threaten to Become Serious, but Tension Is Relieved by Announcement of the Determination of the Company to Carry Passengers Free if They Will Not Pay Its Established Rates of Fare

The franchise complications in Toledo reached a crisis on March 27. With the close of that day some of the principal railway franchises of the Toledo Railways & Light Company, covering parts of the trackage within the city of Toledo, expired. Since Jan. 8, 1912, under a temporary arrangement with the authorities who represented the city at that time, the company has been giving a fare rate of 3 cents between 5:30 and 7:30 a. m. and 4:30 and 6:30 p. m., and six tickets for 25 cents at all other times. It held that under the agreement with the city officials, this arrangement for rates of fare was to be maintained until a satisfactory settlement of the entire franchise question could be made. However, the City Council passed the so-called Schreiber ordinance, providing that after expiration of the franchises of the company on March 27 the rate of fare should be 3 cents flat. This ordinance was passed before the expiration of the old franchises of the company and with the provision that it should become effective at their termination.

Officials of the company have been in frequent consultation with the city authorities in regard to the terms of a new franchise but no settlement has been reached. The present officials of the city government are not those who held office at the time the temporary fare arrangement of 1912 was made, nor are they the same as those who were responsible for the passage of the Schreiber ordinance providing that the rate of fare should be 3 cents upon expiration of the old franchises on March 27. The present city officials, however, were elected on 3-cent fare platforms and have argued for that point without regard to the other questions involved.

Apparently both sides were lined up for some kind of a conflict directly after the time of expiration of the franchises at midnight on March 27. No one knew what would take place. In order to place the matter in the court for settlement, the company had made application to John M. Killits, judge of the United States District Court, then sitting at Cleveland, for an injunction against enforcement of the ordinance. The application for an injunction was argued before Judge Killits by attorneys for the company and for the city on March 26. City Solicitor Thurstin argued that the Federal Court had no jurisdiction in the case and that the Common Pleas Court of Lucas County obtained prior jurisdiction when the suit to enforce collection of \$250 a day rental for the use of streets upon which franchises had expired was filed by Mr. Schreiber, formerly the city solicitor. During the course of his argument Mr. Thurstin deprecated the report that there might be violence and said that it was the intent of citizens who would attend a Municipal Ownership League meeting to be held on the night of March 27 and who would board the cars at midnight, to offer 3-cent fares, but that they would test the matter later in peaceful manner if the company refused to accept.

Mr. Tracy, attorney for the company, called attention to a published statement of Councilman John Mulholland that he intended to insist upon riding for 3 cents in spite of possible court orders.

In postponing the final hearing on the application for a temporary injunction until March 28, Judge Killits then said that if a conflict took place before his deci-

sion in the case was announced he would place the property in the hands of a United States marshal. In accordance with this announcement Judge Killits directed United States Marshal Lapp of Cleveland to go to Toledo so as to prevent possible rioting after midnight, March 27, when the ordinance was supposed to become effective. There were two deputy United States marshals in Toledo and it was stated in the papers that an unlimited number of special deputies would be sworn in if necessary. The statement of Judge Killits was in part as follows:

STATEMENT OF JUDGE KILLITS

"Anticipating, naturally, that the present situation might confront the court at the last moment, some study of the law pertinent thereto has been had, and, assuming that the franchises expire with Friday, as the city contends, we find these principles to control, and on them we expect to act:

"1. The city thereafter has the right to impose reasonable terms for the day use of the streets, and may express those terms in rates of fares, exactions of rentals, provisions for service, conditions of improvement, any and all, as it chooses. If these terms are reasonable and the company attempts thereafter to use the streets, it must be held to have accepted them. Its use of the streets cannot be held to be an acceptance of unreasonable conditions.

"2. The company (although when using the streets without a franchise it is of the nature of a trespasser) may continue to operate its cars without the city's consent, because running street cars is in the line of use for which highways are provided, and because its kind of public service is that necessary to a large and populous community. The so-called Schreiber ordinance in its grant of a day-by-day right to use the streets after March 27, in that respect gave the company no new right.

"3. The company can only operate after expiration of its franchises at the city's sufferance, and its right to do so ends abruptly when the city acts through a new franchise or by imposing reasonable terms for a continued day-by-day use, or by other means at the city's command.

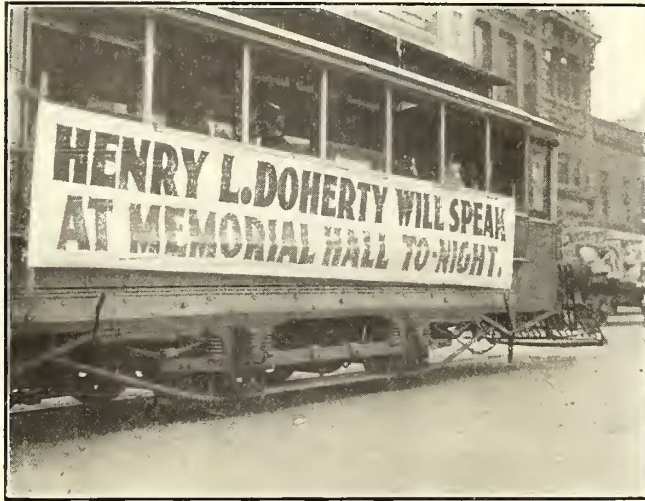
"4. Such use without the city's consent is under the burden of reasonably compensating the public for occupying the streets, either in connection of fare, or payment of rental, or both, as city and company may thereafter agree upon, or as judicially determined, if a contest is forced.

"5. The company may absolutely discontinue operation when the franchises expire, in which case it is entitled to a reasonable time to salvage its property.

"6. This court, in this case, has the jurisdiction to enjoin the enforcement of any ordinance for the use of the streets which is in any substantial degree confiscatory, and, until it is established that terms of an ordinance arbitrarily arrived at are reasonable and not substantially confiscatory, this court may halt its operation pending inquiry.

"It follows that no right exists anywhere to compel the company to run its cars upon any terms as to rate of fare or other conditions which are merely arbitrarily ordained, until it is decided that such arbitrary con-

ditions are reasonable. This court could not take over the business of the company through a receiver and establish an arbitrary rate of fare, or refuse to halt, until inquiry is had, the operation of an ordinance in which an arbitrarily determined rate of fare is fixed, without involving the court in an unlawful confiscation of property if it should develop that the rate of fare failed to bring revenue enough to provide the service



Toledo Fare Dispute—Advertisement of Mass Meeting

the community ought to have, pay proper wages and other necessary expenses of operation, and leave a balance equal to a fair return upon the reasonable value of the investment employed—and the courts are practically unanimous that a fair return should be 6 per cent. This company's right to protection from confiscation is precisely that of an individual owner of property.

"Whether or not 3-cent fare or the alternative of \$250 per day street rental, in case the company declines to accept the 3-cent rate, are respectively, reasonable conditions, is very largely a matter of speculation with most of us. A considerable amount of arbitrary deduction controls our judgments. It may be, however, that the city has data and facts upon which its action in passing the ordinance of last November was based, and which sustain the terms which the company complains to be unreasonable. The Supreme Court of the United States, in the Detroit and Cleveland cases, in which facts legally similar to those involved were passed upon, leaves this court no power to deny the company injunctive relief until we know that it is not asked to carry an unconscionable burden.

"The opportunity now presents itself to fairly work out the question. The company is not protected by a franchise against the city, so that it may be compelled to be fair to the public. The city likewise cannot annoy the company beyond the annoyance incident to the end of franchise rights, which disturbance was a likelihood which the company accepted in taking the expired franchises; it knew that its definite rights would come to an end. Surely, what every honest citizen wants is the best service at the lowest cost for fare consistent with a fair return to the investor upon every dollar honestly invested, and there is but one way to solve the problem.

"If it is desired to continue operation through a receivership, the court will appoint two receivers, one to be suggested by the company and one by the city. They will be given equal authority, and steps will be taken so to co-ordinate details as to prevent opportunity to fairly say that an equal show is not afforded both parties.

"The good sense of the community surely will not tolerate disorder. If this hope is shown to be baseless, we will put the operation of cars in the hands of the marshal of this court for a few days."

On his return to Toledo from Cleveland, Judge Killits commented on the fact that he had received anonymous letters. He said: "If there is any person for whom a public officer trying to do his duty has more contempt than another, it is the coward who writes him anonymous letters. It is only a coward who would do such a thing." He said that he was tired of receiving anonymous letters.

LOSSES UNDER THE ORDINANCE

President Frank R. Coates of the Toledo Railways & Light Company sent a formal announcement to Mayor Keller of Toledo on March 26 that the company would disregard the Schreiber ordinance.

Mr. Coates filed an affidavit in the federal court giving figures in support of the motion for the temporary injunction. He said that if the company had operated under the Schreiber ordinance during 1913, it would have lost \$203,171.

The statement filed by Mr. Coates showed that in the year 1913 the totals of the various cash and ticket fares and the percentage of the totals in each case were as follows: 5-cent cash fares, 10,375,092, or 21.67 per cent; 3-cent cash fares, 1,412,391, or 2.95 per cent; 1-cent children's cash fares, 1,000,643, or 2.09 per cent; tickets at the rate of six for 25 cents, 22,310,996, or 46.6 per cent; 3-cent ticket fares, 12,778,552, or 26.69 per cent. The total number of revenue passengers was 47,877,673. The total number of transfer passengers was 13,173,914, or 27.5 per cent of the revenue passengers. There were 634,581 employees' and special tickets, making a total of all passengers of 61,686,168. The average revenue per passenger was 3.05 cents. The average revenue per pay passenger was 3.93 cents.

Applying the straight 3-cent fare plan to the actual results for the year 1913 the number of 3-cent fare passengers would have been 46,872,242, or 97.9 per cent of the total. The number of 1-cent passengers would have been 1,005,431, or 2.1 per cent of the total. The average revenue per passenger would have been 2.3 cents. The average revenue per pay passenger would have been 2.96 cents.

The cost of the operation of the cars during 1913 was 2.65 cents per revenue passenger carried. This amount was divided by Mr. Coates as follows: Operation, 1.73 cents; maintenance, at the rate of 6 cents per car mile, 0.75 cent; taxes, 0.17 cent. This calculation does not include interest or dividend charges on capital investment or anything for sinking fund, or any payment of rental for use of the streets. It does not include any credit for the amount received from the interurban lines for operation on city tracks.

Mr. Coates also declared that operation was conducted economically last year and that because of the constant rise in the cost of labor and materials it is likely to be more expensive in the future.

Carl H. Keller, the Mayor, issued a proclamation on March 27, stating that the Schreiber ordinance passed on Nov. 24, 1913, would become effective after midnight on March 27, making the prevailing rate of fare 3 cents with universal transfers. He expressed the firm opinion that the ordinance was entirely effective to require the company to accept this rate of fare and that he was sustained in his judgment by the present City Council.

Whatever merit there might be in the contention of the company, Mayor Keller declared that he had the utmost confidence that the people of Toledo would be fully protected and their rights preserved by

the city solicitor and his department. The Mayor also said:

MAYOR COUNSELS AGAINST DISORDER

"I dislike very much to have this controversy between the company and the people find its way into the courts for the reason that court procedure is too often interminable, so that the people become impatient with its delays.

"I sincerely hope that the citizens of our city will proceed in the enforcement of this ordinance in a peaceful and orderly manner, and that they will at all times remember that the city's legal department is at their service.

"My own attitude in the matter will be this: Shortly after midnight to-night I shall enter upon a Summit and Broadway car and proffer the conductor in charge of the car 3 cents in currency. Upon his refusal to accept my proffer of a 3-cent fare I shall communicate this fact to the City Solicitor, who assures me that on Saturday morning he will ask for an injunction compelling the company to accept a 3-cent fare.

"I again urge upon the citizens to employ only peaceable means to accomplish the enforcement of this ordinance.

"The fight for a 3-cent fare is not merely a local one. The eyes of the entire nation are centered upon this city in this struggle, and what is accomplished here to bring about lower fares for the citizens of Toledo will go forth as an example to other cities of the United States. I trust that nothing may be done to reflect upon the fair name of our city."

The city police were kept on duty after midnight on

After several speakers had been heard, Mr. Doherty rose and said, "My name is Doherty and if the audience stands for fair play I would like to be heard."

Chairman Mulholland announced that the regular program had been arranged and that he would not allow it to be stampeded for anyone not on the program. Many people in the audience wanted to hear Mr. Doherty and repeatedly called out his name, but the

HENRY L. DOHERTY

WILL SPEAK

—AT—

MEMORIAL HALL

TO-NIGHT

ON STREET CAR SITUATION

EVERYONE INVITED!

Toledo Fare Dispute—Poster Advertising Mass Meeting

chairman declined to give him an opportunity to be heard. Mr. Doherty listened to the discussion and made no further attempt to get a hearing.

MR. DOHERTY PAYS THE MAYOR'S FARE

One of the most amusing of the events that happened after midnight arose from the Mayor's public announcement, given above, that he would tender a 3-cent fare for a ride. Mayor Keller left his office in the City Hall directly after midnight. He was accompanied by the chief of police and a number of other city officials. They took automobiles for several blocks. They did not know that Mr. Doherty had been waiting for them to appear and was following them in another automobile. When the Mayor and his party stopped and boarded a car Mr. Doherty was there. He gave a dollar bill to the conductor and said to the Mayor and his friends, "You gentlemen are my guests for this evening."

Then the Mayor made another attempt. He and his party started off in their automobiles and Mr. Doherty followed closely in his machine. Stopping another car, the Mayor boarded the platform. Mr. Doherty also appeared, and offered another dollar, insisting that the Mayor and his friends be his guests on that car.

The spirit in which this incident was carried out undoubtedly did a good deal to relieve the tension of the situation.

Later the Mayor found an opportunity to ride without the presence of Mr. Doherty. The fare of 3 cents which he tendered was not accepted and he rode free. After his experience, the Mayor was quoted as saying that he was glad that there was no trouble and that the people were not unfriendly to the present management

WE WISH TO THANK

**THE FAIR MINDED
PEOPLE**

**WHO ARE PAYING
REGULAR FARES
AND THUS SHOW THEY
BELIEVE IN
FAIR PLAY.**

TOLEDO RYS. & LIGHT CO.

Toledo Fare Dispute—Poster Issued by Company

March 27 in readiness to meet trouble if any was started.

A meeting of the Municipal Ownership League was held at Memorial Hall on the evening of March 27. John Mulholland, Councilman-at-Large, presided. Henry L. Doherty, chairman of the Board of Directors of the company, and President Coates were in the audience.

of the company but that they were disgusted with the way the company had dealt with them in years past.

MR. DOHERTY HIRES A HALL WHEN HE WANTS TO TALK

About 10 o'clock on the morning of March 28, Mr. Doherty concluded that he would rent Memorial Hall, where he had been refused an opportunity to speak on the previous evening, and would discuss the issue publicly. Although the time of notice was very short, advertisements were published in the newspaper, posters were prepared and a band was hired to advertise the meeting. The band rode around the city in a car of the company. The car was decorated with banners on the sides calling attention to the meeting. The advertisement said: "Every citizen is invited to Memorial Hall to-night. Henry L. Doherty talks on the street car situation. Everyone interested in the future growth and prosperity of Toledo and in a square deal for all is invited. Eight o'clock. Come early." The hall was crowded.

Mr. Doherty discussed the issue at length. He said that the franchise and the 3-cent fare question had been an excellent political issue. He said that he did not believe in municipal ownership, but that if the majority of the people did, he wanted them to have it. If the people insisted on municipal ownership the company was willing that the city should begin then the condemnation of its property for the purpose of taking it over. If the city was not in a position to buy then, the company was willing to take a franchise with a municipal ownership provision permitting it to buy when it could. Mr. Doherty declared that the company was willing to try a 3-cent fare if it was assured of something better provided this rate did not pay. He said that Toledo wanted good transportation, and that it could not get it on a 3-cent fare basis. Mr. Doherty also offered to let the city put an expert in charge of the railway operations at the expense of the company to determine what rate of fare should prevail.

When the hearing was begun before Judge Killits in Toledo on March 28, to the surprise of the city officials, Carl Nau of Nau, Swearingen & Rusk, public accountants, of Cleveland, appeared as a witness. Mr. Nau was actively connected with the Johnson element in Cleveland when the franchise situation in that city was under negotiation. He has also represented the city of Cleveland in subsequent proceedings in regard to the present railway ordinance in that city. During an early stage of the negotiations in Toledo the city wanted to have Mr. Nau make an investigation and report on the operations of the Toledo Railways & Light Company as a basis for a franchise settlement. The city, however, did not have the money to pay for this report and the expense was met by the company, although it was understood that the work was done for the city. Mr. Nau testified that the gross receipts for 1912 were \$1,895,317, of which \$1,738,145 was obtained from local passengers. The balance was received from interurban roads for use of the track and from miscellaneous sources. If the same number of passengers had been riding on the fare schedule provided in the Schreiber ordinance receipts from local car passengers would have been \$1,292,035. Receipts from other sources would have brought the total to \$1,449,207. Operating expenses, Mr. Nau said, were \$1,463,181, indicating a deficit of \$13,974. This would have been increased by \$95,906 for taxes and \$91,250 for rent. If the rental of \$250 a day provided in a rental ordinance should be added, Mr. Nau testified that the total cost of operating the system would have been 2.97 cents per revenue passenger without any allowance for a return on the investment.

Rathbun Fuller, counsel for the company, amended the cross bill for the company so that it should state that the ground for attacking the ordinance was that the provisions are in conflict with the federal constitution and therefore confiscatory.

The decision of Judge Killits on the plea for an injunction was rendered on March 30. Judge Killits said in part:

DECISION OF JUDGE KILLITS

"That the company may run its cars day by day without the city's consent and charge fare because its service is a public necessity; it may charge a rate that will pay its expenses of operation, including proper maintenance charges, and a fair return for the use of its investment.

"If these ordinances are unreasonable exactions, they are as if they never had been passed by the Council and the company is not affected by their presence on the ordinance books. It may continue to operate its cars until the city ejects it, without reference to them. They are not self-enforcing. We could give the company no safeguard by an order of injunction which is at all necessary to it if these ordinances are unreasonable, for it may ignore them with impunity up to the entry of an order respecting them made by a court whose power the city solicitor may invoke under the ordinances themselves, and when that order is entered the company will be in precisely the same position it would be in if this court should undertake to pass upon the force and effect of the ordinances.

"All we can see the complainant or the company could hope to gain by an order from this court enjoining the city solicitor from fulfilling the duty imposed upon him by the ordinances would be the moral effect of a judgment that the ordinances were unreasonable. While an early solution of this contention is highly desirable we cannot agree that that fact is a sufficient ground for injunctive relief.

"We notice last the insistence that an injunction is necessary to prevent multiplicity of suits and the conclusion that might ensue because of the popular belief that a right exists to ride for 3-cent fares. We have given this question considerable attention and are unable to see how such a situation could be met by any order that this court might make. Its order would be against the representatives of the city only, and could not run against individual citizens, unless the court should completely take into its possession the street railroad system.

"Our order, therefore, would have but moral force, if any, against those disposed to take advantage of the ordinance on their individual accounts, and would not reach the dignity of a prevention. The fear also takes no account of the obvious duty of the peace officers of the city to protect the company in its rights until the ordinance which it questions is tested and determined.

"The section of the Schreiber ordinance which says 'and the continuing by said company of the operation of its cars on lines covered by said franchises expiring March 27, 1914, shall be deemed an acceptance of this ordinance and all the terms thereof,' is so much waste of verbiage.

"It must be borne in mind that the Council is dealing with a corporation engaged in providing a paramount necessity to the city, and the city's power is not to impose any terms, but reasonable terms, upon a use by the company of the public streets for transportation purposes.

"What the people of the city on Saturday needed and had to have if the city was to continue its prosperity and its people enjoy the conveniences to which they are

entitled, was the transportation they had on Friday. While it is Council's function to suggest terms, it is likewise the company's right to question their reasonableness, and that right cannot be denied it.

"The Council imposes terms in the interest of the public; the company likewise serves the public, and the insistence that the company shall lose its right to question the reasonableness of the conditions imposed upon it in the assumed interest of the public, because it serves the public, is intolerable.

"All the company needed to do to avoid this much of the ordinance, it did months ago when it notified the city in writing that the ordinance was not and would not be accepted."

INTERPRETATION OF THE DECISION

Mr. Doherty sent a letter to the City Council giving the company's interpretation of the decision of Judge Killits, saying in part:

"1. The Toledo Railways & Light Company, by operating its cars after March 27, 1914, does not thereby accept the terms of that ordinance.

"2. The Schreiber ordinance will not go into effect until a court of competent jurisdiction has declared that 3-cent fares and \$250 a day rental for the use of the streets are reasonable.

"3. That the city has the right to order the Toledo Railways & Light Company to cease operation of its street cars at any time upon the streets of the city.

"4. The Toledo Railways & Light Company has the right at any time to cease the operation of its street cars upon the streets of Toledo.

"5. That it is the duty of the city authorities to see that the company, so long as it operates its cars upon the streets of the city with the consent of the city, shall be protected and assisted in the performance of its duties.

"With these propositions before us, it seems to us of vital importance that the company be permitted to receive the rates of fare which prevailed prior to March 27, 1914.

"Our experience is demonstrating that the citizens of Toledo, as they come to understand the situation, are willing to continue to pay the above rates of fare.

"The number of passengers insisting on riding at a 3-cent rate, and who were consequently carried free on Monday, were fewer than those on Saturday, and we have every reason to believe that the people will be entirely satisfied to allow our present rates of fare to continue until a franchise agreement is reached.

"We assure you that we will make no appeal for protection at present, for we have been given an excellent demonstration of the fact that the Toledo public is inclined to be fair and we believe that simply by moral effort practically all of the people of Toledo will gladly pay this fare, and thus avoid unnecessary annoyance. In this matter as in all others the company wants to do everything it can to deserve and earn public good will."

The company also advertised its letter in the daily papers and said:

"We now ask that the fair-minded people of Toledo not refuse to pay the rate of fare admitted to be legal prior to March 27. We also request that those who want to be fair and have ridden on our cars free without legal or moral right reimburse the company. Many have already done this without request on our part. We wish to settle this controversy without litigation and delay and will do all in our power to bring about this conclusion and if given the opportunity we will provide for Toledo the best transportation system in the country."

INSTRUCTIONS TO THE MEN

One of the most notable features of the situation has been the loyal conduct of the trainmen. Simple instructions were given to the men. They were signed "By order of President F. R. Coates" by J. M. Enright, manager of railways, and read as follows:

"Accept nothing but the regular cash or ticket fares. Use every peaceable means to collect this fare, but in no case are you to resort to violence or force.

"Do not, under any circumstances, eject passengers forcibly from the cars or use harsh language in arguing with passengers.

"Do not, under any circumstances, accept a 3-cent fare, except during regular 3-cent hours. If necessary, carry any objecting passenger for nothing in order to maintain your regular schedule.

"Keep a careful count of those who refuse to pay the regular fare."

Although the company did not make definite public announcement of its plans, it had them all made and was ready to meet the issue on carefully prepared grounds. Trainmen were instructed with care as to the general policy of the company to accept regular rates of fare and to refuse 3-cent tenders, but were left pretty much to the exercise of their own judgment in individual cases. The result of the warnings of city officials against violence, the presence of an unusual number of city police on the streets, the cautionary words of Judge Killits and the presence of United States marshals combined to keep the crowd which was out in the hours after midnight of March 27 from causing trouble. Of course an unusually large number of people were out to see what was going on but at no point was there any effort to start disorder. As the plans of the company were not generally known except to those who discovered them when boarding the cars, the number who rode free between midnight and the regular beginning of rush-hour traffic on Saturday morning was small. On account of the Saturday half-holiday the number was greater on Saturday. The newspapers really urged the people to ride free. The headlines of one leading paper on the afternoon of March 28 said: "Thousands of men tender 3-cent fares and get free rides. Workers declare they will take families for Sunday joy rides over the entire street railway system." These articles caused many to take advantage of the chance for a free ride on Sunday. Since then the free travel has been lighter each day. On Saturday, March 28 out of a total of 202,744 revenue passengers 10.9 per cent did not pay fares.

WORK OF TRAINMEN

Different men from the offices of the company have spent time on the cars talking and advising with the conductors in the performance of their duties. In the main, however, the conductors have had to be guided by their own good judgment. In the great bulk of cases where passengers have refused to tender anything but a 3-cent fare, the conductors have used arguments in order to get them, if possible, to pay the regular rate. In thousands of cases the arguments presented by the conductors have been effective in inducing passengers to pay present fares. Accounts of many humorous cases have been published in the newspapers. The conductors have not hesitated to use the argument that they were personally interested in the success of the policy of the company. Many people have told conductors that it would make no difference to the employees of the company if fares were not paid. Conductors have contradicted this and have done their best to demonstrate that the company could not continue to pay wages unless it continued to receive fares. Sev-

eral cases of dispute which ended in physical encounters have been reported, but the number of these cases has been very small.

There is no question but that the number of passengers who ride free would be very materially reduced if some means could be adopted of restricting the traffic to the usual riders. Toledo is not so large a city but that the patrons are fairly well known to the conductors with whom they travel. Many conductors have reported that a number of those who ride free are people who have made a practice of walking before. The hoodlums of the city, who have nothing to occupy their time, make up a material proportion of those who ride free. These are, of course, not regular riders and it would not be fair to judge the sentiment of the people of Toledo by the number of men and boys of this type who indulge in the free-riding habit. A number of cases are reported where employers have expressed the hope to the men in their establishments that they would not take advantage of the unfortunate position of the company to avoid the payment of the regular rate of fare.

The closest possible measure of co-operation has been developed between the officials and the employees in all departments of the company. This has been helped by meetings at which the situation has been discussed fully by various officials. It has resulted in giving the employees of all ranks a thorough understanding of the attitude of the company. Meetings of the representatives of the new business department, who come in constant contact with the public, and of the conductors and motormen have been held throughout the present week. Some of these meetings have been addressed by the following: Henry L. Doherty, Frank R. Coates, J. M. Enright and E. R. Kelsey, manager of the publicity department; George Williams, manager of the new business department of the Doherty Operating Company, and Frederic Nicholas, *ELECTRIC RAILWAY JOURNAL*.

Trainmen have been urged to collect the fares if they could induce passengers to pay. In one case a conductor had among the passengers one woman who declined to pay anything but a 3-cent fare and one man who became abusive in argument. When the man had finished his denunciation of the conductor he walked into the car. The woman thereupon arose and handed the conductor a 5-cent piece, saying that she was more ashamed of the man than she was of herself and wanted to pay his fare. Another conductor reported that a man boarded the car with a little child and tendered 3 cents. When this was refused the man and the little child went into the car and the conductor heard the child say: "He didn't taken them, papa; give them back to me so I can put them in my bank." In other cases a man accompanied by another person would hold out six cents in his hand and the conductor would take 5 cents and ask for another fare. In several reported cases of this kind the passenger threw the odd cent at the conductor.

Mr. Doherty and President Coates have literally worked night and day to bring order out of the chaotic situation into which matters were tending. They have not been alone in their efforts. Other officials of the company have worked in similar ways. Many of the employees in various positions have done the same. The solicitors in the new business department have rendered excellent service.

Mr. Doherty has been making his headquarters in Toledo since the situation became acute. He has discussed the questions frankly with anyone and has declared that he wanted to make the facts public.

As matters stand now, the tentative draft of a fran-

chise has been considered by officials of the company and the city. Various clauses have been discussed with the idea that an agreement might be reached readily on all questions except the rate of fare. Mr. Doherty told a committee of the City Council that when it had completed the franchise without a reference to the rate of fare and would say that the document represented the best terms possible, he would state the lowest rate of fare that could be furnished.

In the meanwhile public opinion is more aroused than ever before. It is not aroused, however, in the same way that has been characteristic of proceedings in Toledo previously. Notwithstanding the expressed advice of city officials displayed prominently in the daily newspapers, fewer people each day ride free. A letter from a prominent manufacturer was published in one of the daily papers stating that the company must have a square deal. One of the leading papers remarked editorially on March 20: "You must admire the man who, when he wants to talk, hires a hall."

OPINIONS OF OFFICIALS

President Coates made the following statement to the *ELECTRIC RAILWAY JOURNAL*: "The outlook is good. The percentage of people who travel free is lessening each day. Our trainmen have co-operated with us in every way to protect the interests of the company. Naturally we felt somewhat uncertain about the outcome of our experiment until we could see that the results were not going to be discouraging. We feel certain now that we followed the right course. The public as a whole does not want to take unfair advantage of the difficulty of the company. The large majority of the people want to pay their fares. By the course they have followed they show that they do not approve of the attitude of the city authorities in trying to impose a low rate of fare which is inadequate."

Mr. Doherty said in discussing the situation, that, before he became interested in the Toledo company he had been told that Toledo was a hotbed of radicalism. He had found that there was a radical element in the city, but it was not the controlling element by any means. The majority of the people had shown that they wanted to deal fairly with the company.

ELECTRIC RAILWAYS OF AUSTRIA

The statistics for the year 1913 covering the electric railways of Austria, Bosnia and Herzegovina show a total of seventy-three d.c. lines, of which twenty-five operate at 750 volts or more, and six single-phase lines. Twenty-four of the railways are operated on standard gage and fifty-five on narrow gage. The length of the d.c. lines is 1166 km (723 miles) and of the a.c. lines 242.7 km (150 miles), a total of 1408.7 km (973 miles). During the past year the increase in the number of d.c. lines was twelve and of the single-phase lines three. The increase in the length of d.c. lines was 148.1 km (92 miles) and of single-phase lines 171.8 km (106 miles). These statistics do not include the electric railways of Hungary.

J. M. McElroy, manager Manchester (Eng.) Corporation Tramways, is preparing a report on the proposed construction of a subway line in this city, based upon investigations which he has carried out into methods adopted in other cities. The report will probably contain a suggestion for a mile and a quarter subway, which would cost at least \$1,461,000 and might run up to \$2,435,000. Including the cost of dealing with sewers and street widening, it is estimated that the total cost would exceed \$3,500,000.

COMMUNICATIONS

THE INTERSTATE COMMERCE COMMISSION ACCOUNTS

THE CLEVELAND RAILWAY COMPANY
CLEVELAND, OHIO, March 25, 1914.

To the Editors:

The tentative classification is progressive, and seems to me to be almost complete. Those who have prepared it deserve the thanks of every electric railway company.

H. J. DAVIES, Secretary.

ILLINOIS TRACTION SYSTEM
CHAMPAIGN, ILL., April 1, 1914.

To the Editors:

Replying to your inquiry in reference to the tentative classification of accounts, I have not had time to examine these in detail, but have had one or two of my men go over them, and they seem to report favorably. So far as I can see, the change will make quite an improvement.

D. S. BRAMBLE, General Auditor.

AMERICAN CITIES COMPANY
NEW ORLEANS, LA., March 27, 1914.

To the Editors:

I have just received a copy of the tentative classification of accounts promulgated by the Interstate Commerce Commission and am sorry that I have not the time at present to go into it thoroughly. However, there is one thing which I have had in mind for some time and that is, I would favor a division of maintenance of cars and maintenance of electric equipment of cars into a number of accounts. My experience has been that the amount expended upon maintenance of cars and electric equipment is equal to, if not in excess of, the amount expended upon track and roadway and electric line.

The classification as promulgated provides for eight or nine accounts for the distribution of maintenance of track and roadway and four accounts for the maintenance of distribution system, whereas only one account is allowed for the maintenance of cars and for the maintenance of electric equipment.

S. C. STIVERS,
Assistant Treasurer and Assistant Secretary.

THE COLUMBUS, DELAWARE & MARION RAILWAY
COLUMBUS, OHIO, March 27, 1914.

To the Editors:

During all the years in which I have been engaged in public service accounting, I have realized the need of a uniform system of accounting which would be so flexible and simple that it would permit the best possible information with the least possible expense to the carrier.

It may be truthfully said that the accountants themselves blazed the trail for the present order of things in the accounting field of the electric railroads. We have gone about our work individually and collectively, without hope of reward or fear of punishment, believing that the best interests of our properties would be conserved when we had accomplished the purpose for which we are responsible. If the criticisms and suggestions of the Central Electric Railway Accountants' Association are taken into consideration in the classification now proposed, I believe the system will more completely meet the requirements of the carriers.

One suggestion, well thought of by the Accountants' Association, is that of changing the fiscal year to Dec. 31. I believe this change in date would work to our direct benefit in closing our books. The system now under consideration by the Interstate Commerce Commission for interstate carriers is more nearly complete than any heretofore adopted, and when it is thoroughly understood it will be highly appreciated, I am sure.

After its adoption, the intrastate commissions should immediately adopt the same system in order that we may have one uniform system for all carriers.

A. F. ELKINS, Auditor.

JOPLIN & PITTSBURG RAILWAY
KANSAS CITY, Mo., March 30, 1914.

To the Editors:

It seems to me that the Interstate Commerce Commission in conjunction with the committee of the American Electric Railway Accountants' Association, has handled the revision of the system of accounts for electric railways so judiciously and in such a comprehensive and satisfactory manner that it is entitled to a vote of thanks from the companies and the investing public, who will be benefited by certain changes made in the classification of the operating and maintenance accounts. The extension of standardization to also cover income, profit and loss and general balance sheet accounts, and any slight alterations that might be suggested do not appear important enough to be worth while.

Fortunately the changes effected by the tentative plan are not sufficiently radical to prevent a fair comparison between statements issued under the new rules and those of previous years.

The new provision for the segregation of power accounts I think is admirable and should prove especially desirable in cases where companies operate lighting and power properties in addition to electric railways. Apparently the committee was mindful of this class of companies throughout its deliberations.

The introduction of an account for amortization of franchises will probably call forth adverse criticism, justly, I think, if it is the intention that the apportionments for elapsed years of a limited franchise shall all be crowded into the remaining years of its life. This would work an unnecessary hardship upon many companies whose franchises are of long standing, particularly where there is no reason to question their renewal. Instead of being mandatory, the use of this account should, in my opinion, be optional with the companies, as is the case with depreciation accounts.

E. S. BIGELOW, Auditor.

RUSH-HOUR FALLACIES

MILLVILLE, N. J., March 31, 1914.

To the Editors:

I was very much interested in the editorial on "Rush-Hour Fallacies" in the March 21 number of the ELECTRIC RAILWAY JOURNAL, for my experience in different cities seems to show that a good many of the managers do work more for the rush-hour traffic than they do for the traffic before or after rush hours. To illustrate, I might recount my experience acquired when I lived in the suburbs of a large city a few years ago.

At first I used the steam train in going back and forth from my business because I could get a comfortable seat and have a chance to read the paper. Later I thought it would be advantageous to live within the 5-cent limit and use the street cars, so I moved to a point nearer to my place of business. I had been told that the cars ran frequently morning and evening, on a two and three-minute schedule. I found this to be true during the rush-hour periods. I had also expected that I would be able to take my wife into the city to the theater in the evening, but after one or two experiences I had to give this plan up, and if I had anything to do in the evening I did not attempt to come home for dinner. I did not expect to get a seat during the rush-hour, but when I returned to the city at 7:30 p.m. I certainly did expect to get a seat, or, at least, not to be crowded worse than when I traveled during the rush

hour. But as soon as the traffic in the evening began to slacken, say at about 7 o'clock, the management pulled off all the cars it possibly could, leaving all the people who were traveling for pleasure at that time to be crowded worse than during the rush hours. Again, on our local line, the headway was cut down to fifteen minutes, with the result that if a person lost the 7:30 p.m. car, he might as well give up attempting to go into the city. In consequence, the railroad lost many fares. This policy may be economy of operation, but it does not tempt the patronage of people who are traveling for pleasure.

I took up with the superintendent the matter of increased facilities, or at least of keeping on with the more frequent service for a little longer period in the evening, but he did not seem to think it would amount to anything and let the matter go. I am certainly glad to see that some companies are up to date enough to try to build up their traffic in the manner that you have described.

CHARLES H. BIGELOW.

COMMISSIONS ON ELECTRIFICATION

BOSTON, MASS., March 31, 1914.

To the Editors:

The writer has followed with great interest the controversy reported in your columns between the exponents of different kinds of electrification. The situation is strongly reminiscent of a meeting of a spelling reform association which I once attended, in which the only serious difficulty seemed to be that each of the members was possessed of the only easy and practical scheme for phonetic spelling. There is some question whether a commission on electrification would be any more efficient in standardizing a definite method than the spelling reform association has been in bringing about its long desired uniformity. Mr. Sprague's plan is an attractive one, for it might lead not only to a definite technical plan of procedure but to a financial program which might obviate the very serious difficulty now found by the railroads in financing electrification or anything else. But I venture to submit that the present frame of mind of the advocates of the various systems in this country, as detailed in the articles which have been published from time to time in your excellent journal, is not such as augurs well for a harmonious report unless from a carefully packed commission. The differences of opinion seem too radical and too irreconcilable. In fact, one may go through the list of engineers prominently associated with railway work and arrange them into respective groups as reliably attached to their several opinions as the leaders of party politics in a doubtful state. If it were attempted to form a commission such as that suggested, it is greatly to be feared that the real work would be done in caucus rather than in committee, and once the committee was finally announced its conclusions could be defined without much risk of ruining one's reputation as a prophet. In short, while unquestionably the time is coming when such a commission could do extremely useful work, it is yet more distant than the friends of electrification could wish.

And the second proposition is very similar. Any means of financing electrification for the railroads with a minimum outlay of their own capital practically implies the financing of the change by those otherwise interested in the electrification, and while this may come, and come in a perfectly legitimate way, it should be preceded by more harmony regarding methods and apparatus than has yet been evident. The ends suggested by Mr. Sprague are eminently worthy ones, and in the fulness of time they may be brought about. But up to the present there is very little in the temper of

the discussions before our technical societies to suggest harmony or a judicial decision in the very near future.

BARRETT LEE.

INDEX BUREAU

AMERICAN ELECTRIC RAILWAY CLAIMS ASSOCIATION
CLEVELAND, OHIO, March 28, 1914.

To the Editors:

The ELECTRIC RAILWAY JOURNAL has, for so many years, championed all that is best in the street railway industry and fostered every movement likely to benefit the industry that I am taking the liberty of enlisting its good services in behalf of a project of vital importance to every street railway in the country and one that is dear to me personally as president of the Claims Association.

You are doubtless familiar with the Hooper-Holmes Index Bureau, a clearing house for personal injury claims, and with the good work it is doing in the street railway field. I assume also that you know of the arrangement under which the American Association contributes \$500 per annum to the bureau to secure its services for member companies at slight cost (5 cents per inquiry). It now appears, and I imagine the fact will be as surprising to you as it was to me, that despite this low rate fully 95 per cent of the member companies are not availing themselves of the service, and in failing to report their cases are limiting the service the bureau can give to those who are patronizing it.

Many claim men are apparently forgetful of the advantages of the bureau save when suspicions are aroused by an occasional case. The success of the bureau obviously depends upon real co-operation. The fewer names reported, the less likelihood of return. It further appears that a continuation of this lack of interest will probably lead to the cancellation of the association's subscription and the valuable service of this bureau will be allowed to go by default. This I would very much regret, as I believe the Claims Association has, in this bureau, its greatest opportunity for perfecting a national index bureau, the desire of claim agents for years. The bureau has now in its files some three million names, which it is increasing yearly at the rate of better than 300,000, in spite of the limited support it is receiving from our association.

To pass up this opportunity of availing ourselves of this mass of data would be a calamity. If the service of the bureau, as most of the companies wrongfully assume, were only to run down the accident faker, I, too, should willingly see it thrown into the discard, for the accident faker is now rapidly becoming extinct. But the bureau has and does a real dollar-saving service in preventing personal injury claimants from cashing in more than once on any injury. The detection of one such fraud saves a sum greater than the total cost of a year's entire reports.

I am so sure of the merits of this service and so anxious that all member companies of the association realize them, that I am venturing to ask you to investigate the situation, and if consistent with the facts to speak editorially on the subject. I shall be glad to furnish you any data or information you may desire.

W. F. WEH, President.

The Soria Railway, a line not quite 90 miles long, in the province of Soria in Spain, is conducting an energetic campaign of education to improve agricultural conditions along its line. Many of the railway stations have been provided with little agricultural museums where the farmers and others interested may obtain all kinds of useful information.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates)

EQUIPMENT DEFECTS—TROLLEY POLES

BY C. W. SQUIER, E. E.

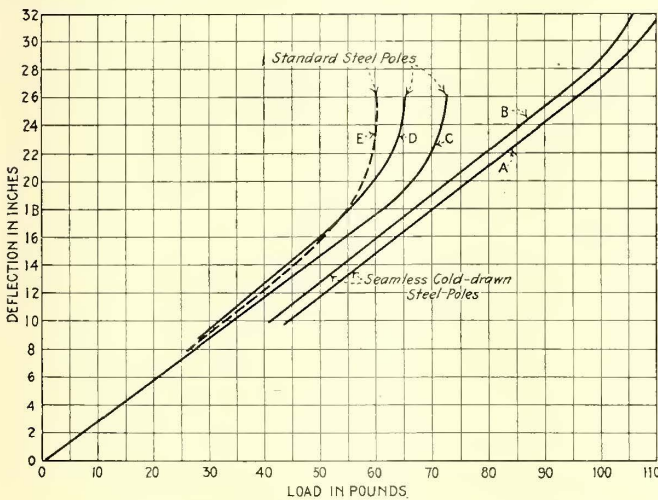
In the ELECTRIC RAILWAY JOURNAL for March 7 the writer discussed some of the troubles experienced with trolley wheels and harps. In this article trolley poles will be considered in like manner.

Poles are made in several different ways. Some are of cold-drawn steel and seamless in construction, while others are rolled up from steel and butt-welded together. The upper end of the pole must be elastic enough to absorb shocks and inequalities in the wire, and it is made as light as is consistent with the strength required. The lightness and flexibility of the pole have much to do with the maintenance of and the life obtained from the trolley wheels.

Poles which give trouble are usually bent, broken or pulled out of their sockets.

POLES BENT, BROKEN OR PULLED OUT

When trolley wheels leave the wire violently the pole becomes bent or broken on striking the overhead con-



Curves Showing Deflection for Trolley Poles with Different Loads at Free Ends

struction. Poles also become bent if the tension springs on the base close all the way before the pole is down, because it is then necessary to bend the pole itself in order to get the pole under its retaining hook. The pressure required to bring the pole down under the hook may be great enough to force the pole to take a permanent set.

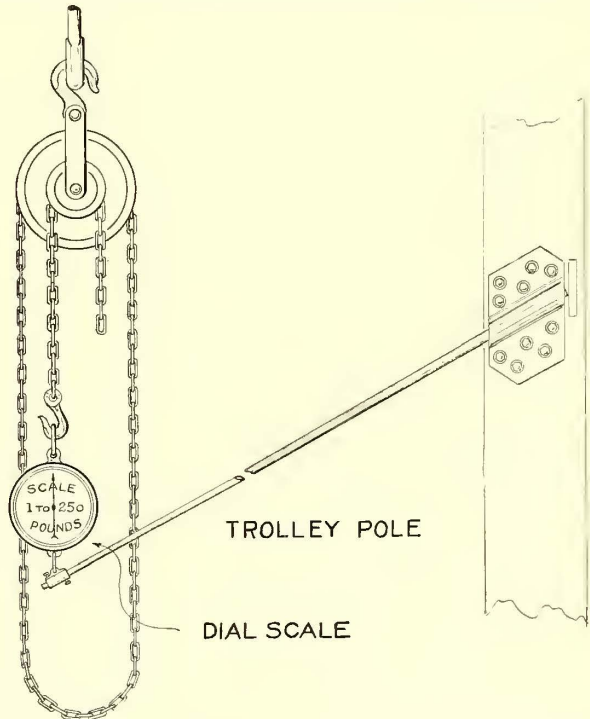
A pole made of tough material like high-carbon steel or reinforced in some manner is less liable to take a permanent set but it is more liable to break and cause accidents. Most roads prefer to have a pole bend rather than break, but the poles should be stiff enough to avoid excessive trouble from bends. Poles should be straightened cold, as any metal becomes softer after it has been reheated. They should also be straightened

between wooden supports, for if straightened between metal supports they are liable to be nicked or kinked.

The usual cause for the pulling out of a pole is that the pole clamp and fork have become worn excessively or that the nuts and bolts in the pole clamp have worked loose. All such nuts should have lock washers and be properly tightened after a new pole is installed. It may be advisable to provide the bolts with cotter keys if the nuts continue to work loose. The clamps and forks should be inspected for wear each time a new pole is installed.

UNIFORMITY OF MATERIAL

Operating companies do not have the time or the apparatus necessary to test poles before placing them



Testing Trolley-Pole Tubing by Means of a Weight and Chain Hoist

in service to see if their quality is uniform or the same as lots previously received. If roads desire to make such a test, however, the arrangement illustrated in an accompanying drawing shows a simple method that could be applied to a few poles taken from each shipment and that would give all the information necessary for a comparison of uniformity.

All the apparatus required is a trolley pole clamp, a chain hoist and a spring balance which should register a maximum of at least 100-lb. or 150-lb. pull. The standard trolley-pole clamp should be mounted in such a location that when a pole is installed in the clamp the free end will come under a hoist. Hook one end of the spring balance to the pole and the other to the hoist. Then take readings of the height of the pole from the

floor and the pounds tension corresponding to the different heights. This will give the pull in pounds necessary to produce any deflection. By plotting these values curves of the form reproduced will be obtained. The curves shown are for two cold-drawn steel poles and two standard steel poles. As indicated by the bend in the curves, the deflection is proportional to the load up to the point where the pole starts to take a permanent set. The cold-drawn steel poles, as shown in curves "A" and "B," took a slight permanent set with a 105-lb. load, and the standard steel poles shown by curves "C" and "D" did so with a 60-lb. load. The dotted curve "E" is made from a test on the same pole as was used for curve "C" after this pole had been straightened cold, and this last curve demonstrates how much easier it is to distort a pole if it has ever been bent before.

EQUIPMENT AND STORES ECONOMIES ON THE THIRD AVENUE RAILWAY SYSTEM

BY A. R. JOHNSON, ASSISTANT TO SUPERINTENDENT OF EQUIPMENT THIRD AVENUE RAILWAY, NEW YORK

The maintenance costs of the equipment department of the Third Avenue Railway for the past three years show a slight increase over the two years preceding 1913, owing to the fact that in the early part of that year President F. W. Whitridge authorized an increase of 1 cent per hour to all employees of the company. If this increase had not been made, the costs per car mile would have continued downward. In view of the latter fact, it may be interesting to mention a few of the equipment department practices which are in vogue at our Sixty-fifth Street shops.

The saving in the manufacture of controller segments is a good example of piecework economies. New segments cost from \$11 to \$13 per 100, while we make them at a piecework price of 75 cents per 100. As we made more than 11,000 segments during the past year, the saving on this item alone was approximately \$1,000. Again, a new controller finger costs about 9 cents and has a scrap value of only 3 cents. We collect the worn fingers from the carhouses, regrind them at a cost of 1 cent each and then send them out for additional service. Thus we double the amount of wear and still receive the scrap value. As 22,000 fingers were reground during the past year, it is clear that quite a saving was attained even on this trifling item. Our Hampden grinder* for cast-iron pony wheels saved us about \$4,000 during the past year. The electric welding plant, which we built up largely of home-made materials, has reclaimed thousands of dollars' worth of gear cases, motor frames, axles, armature shafts, truck sides and other parts from the scrap pile.

Low maintenance costs also follow from the means used to secure the maximum amount of service from the brakeshoes and lubricants supplied to the various carhouses. Each carhouse foreman is required to forward to the office of the superintendent of equipment a monthly report which shows the amounts of the different types of brakeshoes and lubricants which were on hand at the beginning of the month, the amounts received later, the amounts used and the amounts on hand at the end of the month. These figures are recalculated to a mileage basis, and the statistics comparing all carhouses are sent to each foreman. Due allowance is made, of course, for differences in equipment and service. This practice and the standardization of shoes and shoe-heads have reduced lubrication and brakeshoe costs 33 per cent during the past year.

*See ELECTRIC RAILWAY JOURNAL, page 886, May 25, 1912.

STORES PRACTICES AND ACCOUNTING

The monthly reports from the foremen are also of value in preventing an undue stocking of material. All material for the equipment department is delivered to the general storeroom and charged to the material and supplies account. When material of any kind is required by this department a storeroom requisition of the type illustrated is made out in triplicate. This requisition always shows the account number to be charged. One copy is retained by the foreman who receives the material, and two copies go to the general storekeeper, who enters the cost of the material on the duplicate copy. The storekeeper forwards all duplicates at the end of each day to the distribution clerk of the equipment department. The distribution clerk then posts the proper charges to the various account numbers and, to catch possible errors, checks the amounts as charged by the storekeeper. This distribution is tabulated at the end of each month and forwarded to the accounting department, which then deducts whatever credits may be due, such as scrap, and sends a statement to the equipment department. This manner of accounting has been found very satisfactory because it keeps the equipment department adequately informed

| STORE ROOM REQUISITION. | | | | | | | |
|-------------------------------|------------------------------|---------|-----------|----------|------|----------|---------|
| THIRD AVENUE RAILWAY COMPANY. | | | | | | Nº 35200 | |
| Original | | | | | | | |
| ITEM | MATERIAL | AMOUNT | | | COST | | AC. NO. |
| | | ORDERED | FURNISHED | RECEIVED | UNIT | TOTAL | |
| 1 | | | | | | | |
| 2 | Manganese Bronze Jack Plates | 2 | 2 | 2 | .69 | 1.38 | 107 |
| 3 | Pony. | | | | | | 10 |
| 4 | | | | | | | |

| | | |
|----|--|------------------|
| 10 | Chargeable to Job No. 100 at 65th Shop | Date Jan 20 1914 |
| | Ordered by E. Smith | Date 19 |
| | Furnished by Jones | Date 19 |
| | Received by J. Brown | Date 19 |

Specimen of Storeroom Requisition

about the amounts which are being charged for maintenance.

Particular attention is paid to having the proper account numbers appear on the time cards which go to the distribution clerk. To guard against any irregularities, an itemized list of the various account numbers is supplied to every foreman, outlining the different classes of work embraced. These cards are taken up each morning by the checker, who sees that the proper charges are made and that all piecework quantities are checked. This checker is necessary because most mechanics are more intent on doing their work than paying attention to account numbers. Our account numbers are subdivided to observe the costs of the individual items. For instance, "Repairs to Passenger Cars," Account No. 107, is subdivided as follows:

- 107A—Repairs to car bodies.
- 107B—Painting.
- 107C—Fenders.
- 107D—Trucks.
- 107E—Driver wheels.
- 107EE—Pony wheels.
- 107F—Hand brakes.
- 107G—Air brakes (Allis-Chalmers).
- 107H—Air brakes (National).
- 107I—Changing equipment from box to open cars and vice versa.
- 107J—Heaters and lights.
- 107K—Fare boxes, etc.

The same method is pursued with all the following account numbers, such as:

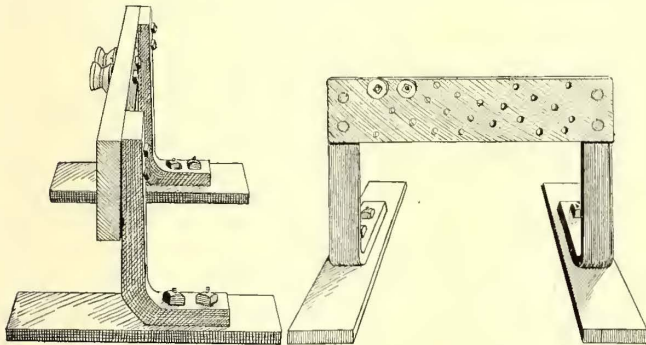
- 109—Repairs to service cars.
- 110—Repairs to electrical equipment of all cars.
- 111—Repairs to shop tools and machinery.
- 112—Shop expenses.
- 113—Vehicles.

We include service vehicle maintenance cost as part of the equipment department maintenance, although many other railways do not. In 1913 this item alone amounted to nearly \$16,500, or about \$0.00056 per car mile.

PIPE BENDER AND POLE STRAIGHTENER

BY JOHN DUNCAN, MASTER MECHANIC FORT DODGE, DES MOINES & SOUTHERN RAILROAD

The operating department of the Fort Dodge, Des Moines & Southern Railroad uses for pipe bending and trolley pole straightening the simple and inexpensive means shown in the accompanying sketch. The con-



Outfit for Pipe Bending and Pole Straightening

trivance is made from one piece of 1-in. x 10-in. iron, 4 ft. long, into which numerous holes are bored in order to get any angle that is wanted. The bar is mounted on two right-angle irons, the yoke thus formed being bolted to a pair of 2-in. x 6-in. planks, so that the equipment can be shifted to any part of the floor. The sketch also shows a pair of bolted spools used in connection with pipe jobs.

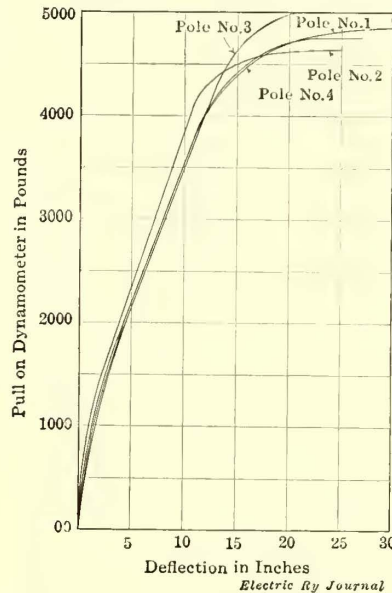
CONCRETE POLE TESTS IN SYRACUSE

The New York State Railways, Utica-Syracuse Line, have some 1400 reinforced concrete poles in use on their various city and interurban lines. The first of these poles were manufactured in 1910, and since then the method of manufacture has been developed so that the poles have been adopted as the standard throughout for certain lines where there is heavy traffic. The method of constructing the poles and the details of the pole yard were given in the issue of the ELECTRIC RAILWAY JOURNAL for March 15, 1913, page 502. The standard pole for double-track city construction, either span or bracket, is of 7-in. top and 13-in. butt and is 30 ft. long. The standard interurban pole is of 7-in. top, 14-in. butt and is 35 ft. long. An 8-in. top, 14-in. butt, 30-ft. pole is constructed for heavy city work and corners, and an 8-in. top, 17-in. butt, 45-ft. pole is also manufactured for heavy-feeder line work. The standard 30-ft. pole weighs approximately 3200 lb. and costs complete, including all material and labor, maintenance of plant, etc., \$12.03 at the yard. This pole is designed to take the place of the steel tubular pole, which costs approximately \$35.

RESULTS OF RECENT TESTS

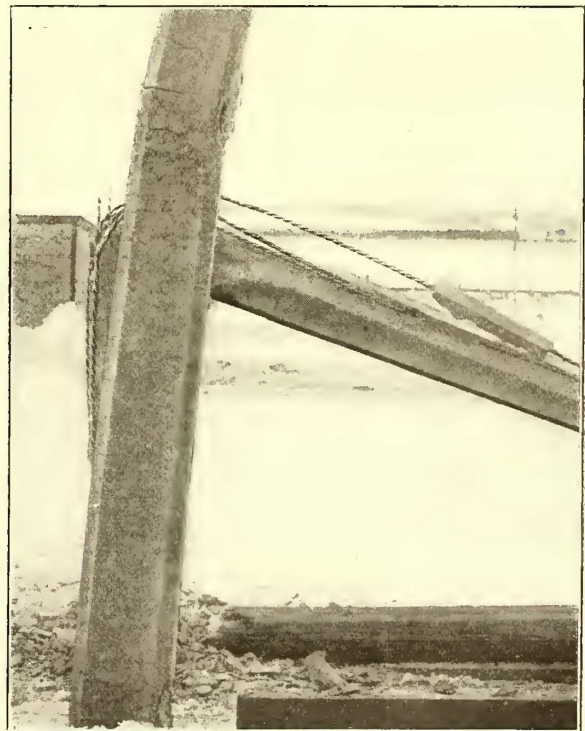
On March 12, 1914, a very satisfactory test of some of the poles was made at Syracuse. Four poles were tested. The purpose of the test was to determine not only the stress-strain diagram for the poles but also the best method of placing the reinforcing rods.

The poles were 7-in., 30-ft. poles made of concrete of a mixture of one part cement, two parts sand and two parts of stone. The reinforcement for pole No. 1 consisted of four 5/8-in. twisted rods 29 1/2 ft. long placed in the corners and four 1/2-in. x 23-ft. rods, four 1/2-in. x 16-ft. rods and four 1/2-in. x 8-ft. rods evenly spaced along the sides. The same construction was used in pole No. 4. Pole No. 2 was constructed the same as the standard pole with the exception that three of the center rods on each of the two sides were placed back of the rods on a compression and tension side. Pole No. 3 was constructed the same as the standard pole with the exception that a web reinforce-



Stress-Strain Diagrams of Concrete Poles

ment of No. 8 steel wire was wound around the various reinforcing rods at intervals of 5 in. throughout the length of the pole. All of the poles were aged from four to four and a half months.



Concrete Pole No. 3, Failing under a 5000-Lb. Pull—Broken Pole in Rear

Poles No. 2 and 3 were tested simply to determine

whether or not the bunching of reinforcement on the tension and compression sides, or the installation of web reinforcement, would produce enough greater strength or stiffness over the standard method of construction to warrant the expense of the additional reinforcement, or the inconvenience produced by the necessity of placing poles like No. 2 with a bunched reinforcement in such a position that the tension and compression sides would always be perpendicular to the direction of the stress.

For testing purposes the poles were set 6 ft. in the ground with a rake of 9 in., and a 2-ft. ring of concrete, 1 ft. thick, was placed at the ground line and also at the butt. Wooden poles were placed on the ground between the butts of two of the concrete poles so as to maintain the base of the latter in position. In the tests the poles did not move in the ground more than 1/16 in.

A 7/16-in. steel cable was connected by means of an eye-bolt through the pole under test at a point 21 ft. above the ground line, and a 5000-lb. dynamometer was placed in the cable close to the pole. The cable was passed through a sheave at the same distance from the ground on the pole opposite the one under test. The pull was applied by means of a set of tackle blocks in increments of approximately 200 lb. up to failure. Deflection from the vertical was measured at the point of attachment of the cable by means of a surveyor's transit.

The accompanying curves show the results of the test and bring out the fact that the changes from the standard method of construction involved in bunching the rods are not justified by the resulting slight increased strength of the poles.

The tests described were carried out under the direction of Henry G. Throop, superintendent of lines and buildings New York State Railways.

CORRECTING DERAILMENT TROUBLE FROM MAXIMUM TRACTION TRUCKS

BY R. P. WILLIAMS

A switch may unjustly acquire a bad name for derailments on account of its location, while the derailments may be wrongly ascribed to the type of their construction. When derailments are taken as a matter of course there is a tendency to refrain from an investigation which might cure the trouble.

When a switch is placed in a curve more or less trouble is always expected because it has no tangent at the point end. Of course, no engineer would place a switch in this way if he could avoid it, for no switch can be considered safe if its entrance has no tangent at least one wheelbase long. We have a switch without a tangent ahead, and when we renewed it last we determined that nothing other than its unfavorable location should be left in it to invite derailments. The tongue was ground to a safe bevel, and the mate side guard was ground so that the inner edges of the wheel flange would not bind. We were proud of the completed switch. Judge of our surprise a month later when we were told that derailments were frequent. "Of course," said the transportation inspector, "the derailments are not serious because we always have a man stationed at the spot." It was then decided that the trouble was due to the manganese tongue because it was so much harder than the steel wheels, as indicated by the fine shavings lying about. A forged tongue was installed, and instructions were issued that every derailment be reported. The change from a manganese to a forged tongue did reduce the derailments about 50 per cent, but they were still too frequent for safety. After the

forged tongue was worn to what we considered perfect shape, we took the original manganese tongue, ground it carefully to the same shape and put it back in the switch. After a time the derailments began again in spite of the change.

Now that we were satisfied that the switch itself was perfect, we turned our attention to the trucks that were operated over it. Seven repeaters were noted. In each case we found that the trouble was due to such truck defects as these: narrow-gage wheels, heavy side bearings and excessive length of compression bolts. The principal trouble, however, was lack of grease. Heroic measures were taken to cure the last-named defect by detailing men to grease every side bearing whenever the track had been freely sanded after a storm. The result was that derailments at this point were eliminated entirely and the switch lost its bad reputation.

In another instance derailments at a certain new right-hand switch were numerous. This switch had a manganese tongue, and the guard side was too straight. We gave it the proper bevel, with the result that no further derailments occurred except with maximum traction trucks. One offending truck was put over the pit and tested for flange, gage and side-bearing trouble. The only defect found, however, was a slight creeping wear in the forward pony wheel. After this defect was removed the car was tried again but did not show improvement. We then learned that this type of truck was constructed to throw 70 per cent of the car weight on the drivers and 30 per cent on the ponies, and that the trucks were used with the pony wheels leading.

When the test car was returned to the shop the trucks were examined again. This time we found that there was no weight on the right forward pony wheel, and that five-eighths of the compression had been exerted on the left forward pony before the right forward wheel had received any. The records showed that this truck had been derailed at almost every right-hand switch on the line. The cause was therefore readily removed by going over the adjustments of the truck to insure the equal distribution of weight on both pony wheels.

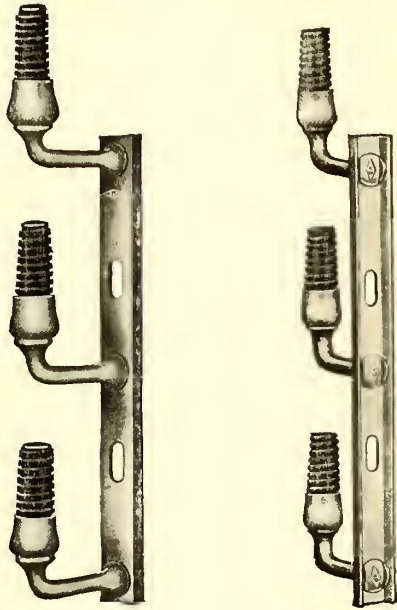
The moral of this experience is that we must examine every side of the case before we say this or that is the fault. The maximum traction truck had acquired an unsavory reputation and was condemned as a class. In fact, derailments were taken so much as a matter of course that motormen took no special pains to avoid them. Now, if derailments occur at any point throughout the system, we examine the truck as well as the special work.

MAINE ELECTRIC RAILWAY STATISTICS

According to the fifty-fifth annual report of the Board of Railroad Commissioners of Maine, there were fourteen electric railroads and one horse railroad in the State on June 30, 1913. The total mileage of street railways was 485.09 miles, there being no increase during the year ending on the above date. The number of employees, including general officers, was 1825 as against 1840 in the year previous. The gross assets of the several electric railways were \$32,733,851, and the gross liabilities, including capital stock, \$31,949,708, these amounts being increases of \$4,878,462 and \$4,420,002 for the previous year. The aggregate capital stock amounted to \$14,378,968, an increase of \$126,800. The total amount of dividends declared during the year was \$324,395, an increase of \$95,917. Seven of the companies paid dividends varying from 3 per cent to 7 per cent and eight paid no dividends at all.

HOT-RIVETED BRACKETS WITH IMPREGNATED COBS

The impregnated locust or oak cobs used in the construction of the brackets illustrated herewith are slowly forced into the cold-drawn steel shells under a pressure of several tons. A desirable wood thimble is thus secured without the danger of splitting the cobs. The wall plates are made of pressed-steel and open-hearth



Front and Rear Views of Electric Riveted Brackets

channels and the brackets of hot-forged open-hearth steel. The brackets are riveted hot with electrically operated riveters. No metal portion of the bracket touches the insulator. These brackets are the product of the Barnes & Kobert Manufacturing Company, New Haven, Conn.

TESTS OF TITANIUM RAILS

The fifth bulletin covering rail reports made by the Titanium Alloy Manufacturing Company has just been issued. This contains detailed results of chemical analyses and physical tests upon a number of rails, titanium-treated and untreated. The bulletin adds to the tests reported previously results from six sections of open-hearth rails rolled during the summer of 1913 for a southern railroad system. Sulphur prints, etched sections and micro-photographs of etched and unetched steel are included in the report, as in the case of previous bulletins. These are remarkably illuminating illustrations of the actual structure of the steel which entered into the different rails.

From the results of all of the tests given in the bulletin it was indicated that the treated rails in general were stronger, and, except in the case of one rail, were less ductile than the untreated specimens, although this is possibly due to the fact that the treated rails were higher in carbon at head and flange than were the untreated rails. In view of the greater average strength and hardness of the treated rails they might have been expected to show lower impact resistance, but the results obtained from them in the endurance tests appear to be about equal to those obtained from the untreated rails.

The tests and photographs show the difference between segregated rails with hard centers and other rails with soft centers. The latter gave more uniform results in the vibratory endurance tests and this indicated a greater degree of safety when in use in the track. It

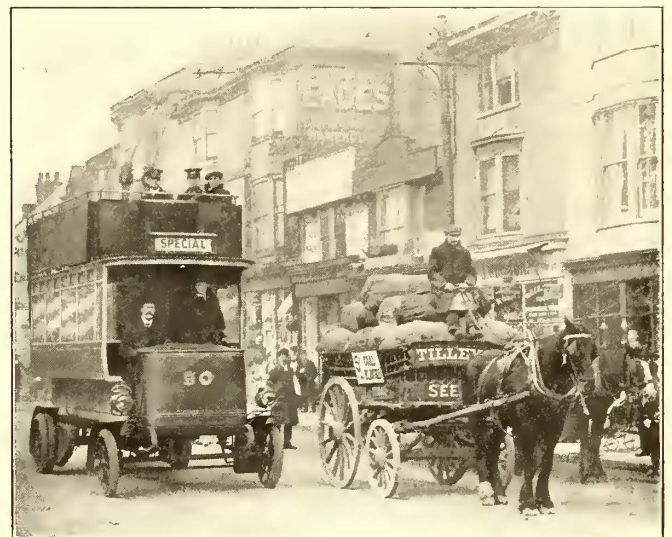
was found that, in the treated rails, there existed a pink slag of unknown character, although the latter was not found segregated in dangerous, weakening streaks. Since two of the three untreated rail specimens were badly segregated and none of the three treated rails showed any such indication, the tendency of ferro-carbon-titanium in preventing this harmful condition was believed by the manufacturing company to be well demonstrated.

DOUBLE-DECK TRACKLESS TROLLEY BUS ON TRIAL AT BRIGHTON, ENGLAND

The R. E. T. Construction Company, Limited, London, England, recently loaned to the Brighton Corporation Tramways the first double-deck trackless trolley bus ever built. As shown in the accompanying illustration, this bus is being used in experimental service on a wood-paved street in the famous pleasure resort named. The route is 2100 ft. long and is on a thoroughfare in the center of the town where the flexibility of the trackless trolley bus can best be determined.

The vehicle has a 13-ft. wheelbase and is equipped with two 20-hp completely inclosed commutating-pole motors. Two types of brakes are provided, the hand brake acting on the shaft, and an external expanding brake on each of the back wheels. The apparatus controlled by the motorman is compactly arranged on the front platform. The steering gear is immediately in front of the motorman and the controller is in a convenient position on his left-hand side, while all the other controlling parts are within easy arm's reach. The two trolley bases, one being needed for the return circuit, are situated at the back of the bus. The present bus accommodates thirty-eight passengers, but this vehicle by no means represents the limit of capacity in double-deck buses.

In one of the tests at Brighton the bus was success-



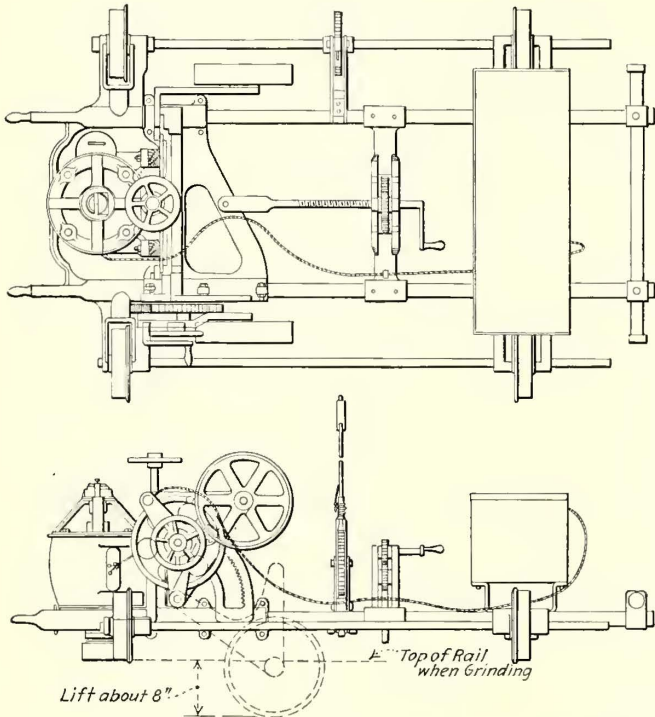
Double-Deck Trackless Trolley Bus Making a Turn-out on a Brighton Street to Pass a Truck

fully zigzagged across the whole width of the roadway. At present no provision has been made for turning the vehicle at the terminals, but even under the present conditions the motorman is able to turn the vehicle in ten seconds.

Easy acceleration, almost completely silent running, smoothness of motion, absence of skidding, flexibility of movement and lack of disagreeable odors are the chief advantages asserted for this system in comparison with gasoline buses.

PORTABLE TRACK GRINDER WITH CUP WHEEL

An important auxiliary of the electric joint-welding process of the Indianapolis Switch & Frog Company, Springfield, Ohio, is its improved portable track grinder for producing a smooth finish after the steel or manganese has been added. Among the distinctive features of the machine illustrated are light weight (1500 lb.), freedom from chattering and avoidance of dips or irreg-



Elevations and Plan of Rail Grinder

ular spots even in the hands of inexperienced men. As to the first feature, the weight is so balanced through the carrier wheels that the carriage can be swung around and easily taken from the track by two men in ten seconds. The use of a cup wheel of emery or other

SIDE-ENTRANCE CARS AT BIRMINGHAM

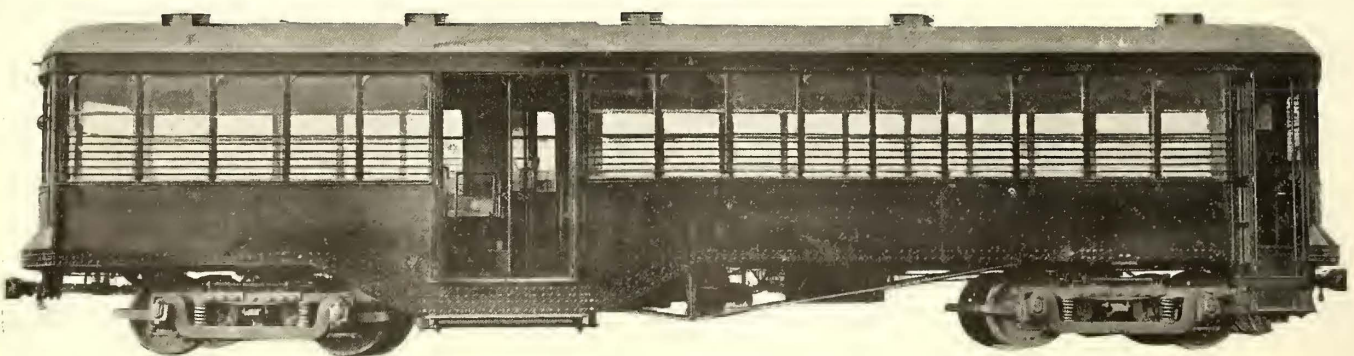
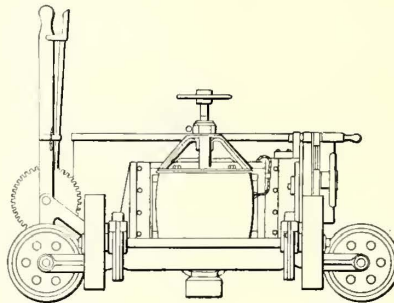
Within the past year the Birmingham (Ala.), Ensley & Bessemer Railroad purchased from the Southern Car Company, High Point, N. C., five side-entrance cars of the type shown in the accompanying illustrations. In these cars the side-entrance principle has been adapted to permit separate compartments for colored and white passengers. Colored passengers enter and leave at the left-hand side of the dividing rail while the white passengers use the other side of the rail. As the white compartment is larger, it is also furnished with a front exit. A sliding step is used at the main opening, but a folding step was required at the front to avoid fouling the front truck during swiveling. All doors are hinged and are clear-glazed. The successive steps from the ground to the car floor are 13 in., 14 in. and 10 in. plus a ramp of 3 in. up to the bolster line. As the cars are operated single-ended, the devil-strip side has no doors other than one which is used by the conductor to adjust the trolley pole.

The cars are 47 ft. long over the bumpers and 8 ft.

7 in. wide over all.

The side sills are composed of 6-in. x 6-in. x $\frac{3}{8}$ -in. angles running the entire length of the car. To these angles a $\frac{3}{16}$ -in. x 32-in. steel plate is riveted to form the side sheathing, a stiff plate girder being obtained by riveting 2-in. x $1\frac{1}{2}$ -in. x $\frac{1}{4}$ -in. angle irons to the sides. At the main side opening

for passengers the side sill angle is reinforced by $\frac{1}{2}$ -in. x 12-in. steel plate bent to shape and extending about 4 ft. on each side of the opening. The side sill angles of the plate girder are further strengthened by an under truss securely fastened to the angle and form-



One-Way Side-Entrance Car for Birmingham, Ensley & Bessemer Railroad

abrasive material is perhaps the most characteristic feature. This wheel is driven by vertical motor of 3 hp to 5 hp, and as it is adapted for wet grinding it can cut very rapidly without burning. The carriage is oscillated or propelled by means of a ratchet lever placed in the center. The normal arrangement of the machine will take care of all surface work. However, for grinding down in grooves or for roughing surface work, the motor is thrown from the vertical to an inclined position to permit the attachment of a flexible shaft and ordinary-shaped wheel. This grinder can also be used for the attachment of drills or reamers.

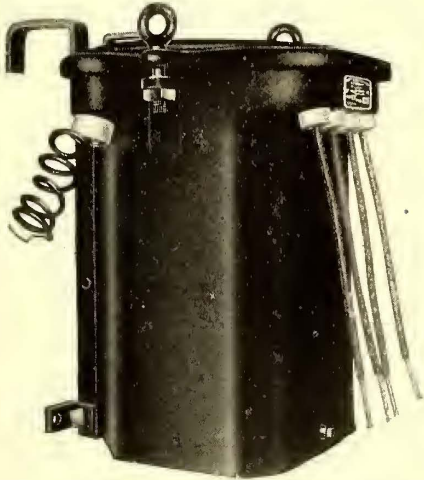
ing truss posts about 4 ft. in front of the center-door opening. The cross-sills at the main side opening and other smaller floor members are 6-in., 10 $\frac{1}{2}$ -lb. channels. A conduit for cables and pipe was formed by riveting a $\frac{5}{16}$ -in. x 12-in. plate on top of the center channel structures and a $\frac{1}{2}$ -in. x 4-in. plate on the bottom of the center channels at each crossing.

The posts are of white ash or oak. The roof has both white oak and steel carlins, the latter being placed at each side post. The interior finish is of cherry and the ceiling is agasote. The arch roof is supplied with ten Garland ventilators. The car seats fifty-eight.

A NEW LIGHT-WEIGHT PRESSED-STEEL TRANSFORMER CASE

A radically different type of transformer case for distributing transformers has lately been placed on the market by the Pittsburgh Transformer Company after several years of development and testing. This new case is of pressed-steel, blue-annealed planished plate, and naturally it is much lighter than the ordinary cast-iron cases.

Transformers are really a tonnage material when considering the handling expense, the lightest and



Transformer Made with Pressed-Steel Case to Secure Economy in Weight and Shipping Cost

smallest size weighing at least 100 lb., and the medium and larger sizes weighing up to 3000 lb. each, for the pole-type sizes. The handling of a distributing transformer is necessarily done by the line-crew with "hand-power" and "man-power," which is higher in cost than "horse-power." The saving in the cost of freight is, of course, in proportion to the reduction in weight and averages 30 per cent. While it is difficult to get accurate central station costs for the handling of such heavy material as transformers, fairly close estimates show that on 10,000 lb. of transformers shipped 500 miles, the freight, cartage, loading, unloading, warehousing, installing, etc., costs about \$110. Thus, a 30 per cent decrease in weight saves \$33. The appreciable weight reduction also permits larger transformers to be mounted on poles with the same pole-strain safety factor, or permits the use of smaller poles for given transformer sizes.

It is asserted, furthermore, that the new pressed-steel case is also much stronger than cast iron, so that it will stand up even better to the everyday wear and tear, rough handling in transit and the accidental bumps and jars which may happen when a transformer is dropped from a pole or wagon. Thus it is reported that in laboratory tests, thirteen blows with a sledge hammer failed to show any injury, except slight indentation of the pressed steel, whereas, two blows of the sledge applied to an ordinary cast-iron case cracked the cast-iron case with the first blow and completely shattered it with the second blow.

Finally, unless the common cast-iron case is carefully japanned it will leak oil, due to seepage through the porous cast iron, and where the cast iron is imperfect or thin, hot transformer oil will seep through the metal and drip. Pressed steel, due to its density and non-porous structure, eliminates the possibility of oil seepage.

1200-VOLT HIGH-SPEED PASSENGER LOCOMOTIVES OF THE OAKLAND, ANTIOCH & EASTERN RAILWAY

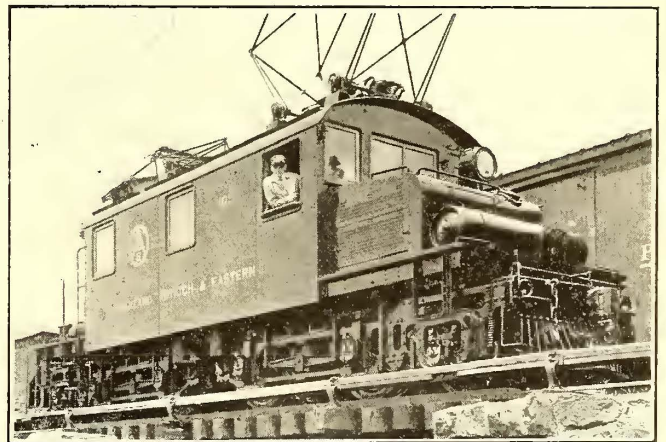
Business has increased so rapidly since the opening of the Oakland, Antioch & Eastern Railway that in order to cope with the heavy through-passenger traffic between San Francisco and Sacramento it has been necessary to place in operation two 62-ton d.c. locomotives for hauling passenger trail cars. Each locomotive when operating at, say, 56 m.p.h. is capable of hauling a train of five steel passenger trail cars, weighing 37.5 tons each, on a level tangent track at 1100 volts. With only three of these cars, one of these locomotives under the same track conditions is able to attain a balancing speed of about 60 m.p.h.

MECHANICAL PARTS

The mechanical parts were built by the Baldwin Locomotive Works, Philadelphia, Pa. There are two articulated trucks each having six wheels, four of which are drivers, making a total of eight drivers per locomotive. Each group of wheels consisting of two pairs of driving wheels and one two-wheeled radial truck has an independent frame. These two truck frames are connected together with an articulation link. The cab is mounted on a separate frame which is supported on the truck frames by eight spring-loaded friction plates, no draw bar pull being transmitted through the cab. The cab center pins carry no weight and are used simply to maintain the position of the cab with respect to the trucks.

The truck side frames are steel castings of the steam locomotive type, 3½ in. wide, with their centers 76 in. apart transversely. These frames have renewable wearing gibs on the pedestals. The two-wheeled trucks under the ends of the locomotive are of the modified Rushton type with radius bars, and are equalized with the driven wheels. In each group of wheels the equalization is continuous on both sides of the locomotive.

The truck frames are braced transversely at each end and also at two intermediate points. The cross-ties at the inner ends of the frames have radial faces



1200-Volt D.C. High-Speed Passenger Locomotive of the Oakland, Antioch & Eastern Railway

which bear against each other. These cross-ties are provided with spring buffers placed 38 in. apart. In negotiating curves the inside buffers are compressed, thus tending to restore the alignment of the frames after the curve has been transversed. These buffers, being in contact at all times, also help to promote steady riding when passing over rough tracks.

The cab underframe is a built-up structure composed of channels, plates and angles. The longitudinal

sills are four in number and they consist of 8-in. channels which have a length of 33 ft. 11¼ in. The width over the outside channels is 8 ft. 10 in. This structure is spring supported at eight points, four on each truck frame. The center pins which hold the cab frame in alignment with the trucks are 14 ft. 8½ in. apart. One of these pins is allowed a limited amount of longitudinal movement in the center plate on the cab frame to compensate for the varying distance between truck centers when the locomotive is traversing curves and to relieve the cab frame from buffing shocks. The cab is arranged for double-end operation. The automatic couplers have radial drawbars with centering springs. The principal dimensions of these locomotives are presented in an accompanying table.

ELECTRICAL EQUIPMENT

The control for the traction motors is of the Westinghouse unit switch field type (HLF), similar to the type HL except that the field control takes care of the extra field tap of the motors. The control equipment

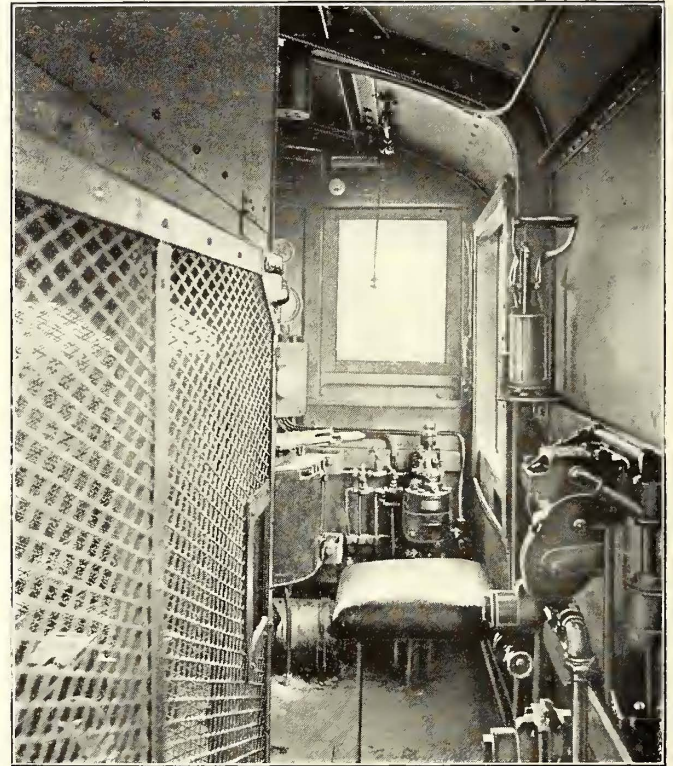
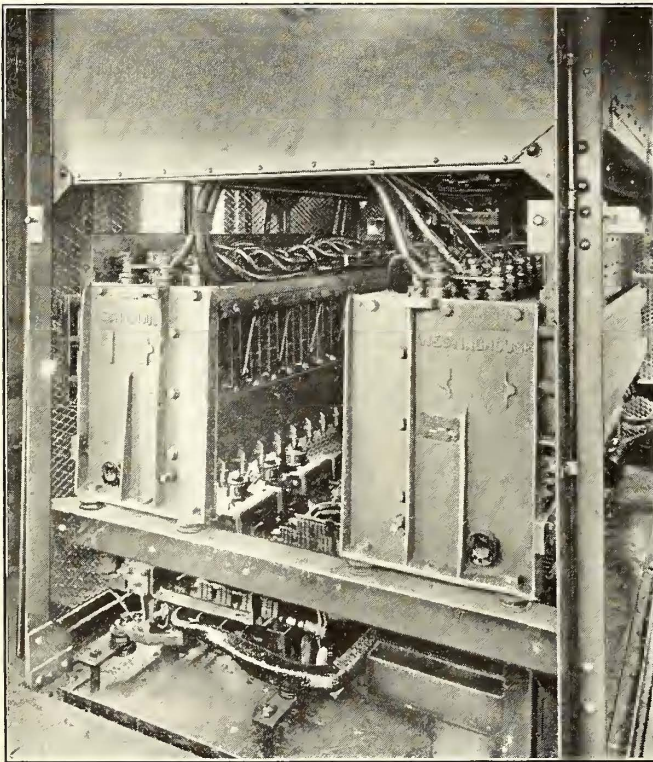
resistors, one series-parallel switch, two reversers, one main switch, one main fuse and box, one set of train line connectors and one set of grid resistors.

Each locomotive is propelled by four Westinghouse No. 308-D-7 250-hp motors. These motors are of the commutating-pole box frame type arranged for field control.

LOCOMOTIVE DATA

| | |
|---|----------------|
| Gage | 4 ft. 8½ in. |
| Wheelbase, rigid | 7 ft. 4 in. |
| Wheelbase, total | 31 ft. 0 in. |
| Driving wheels, diameter, outside | 42 in. |
| Driving wheels, diameter, center | 37 in. |
| Driving journals | 5 in. x 9 in. |
| Truck wheels, diameter | 30 in. |
| Truck journals | 4½ in. x 8 in. |
| Width over all | 10 ft. |
| Height to top of cab | 12 ft. |
| Length center to center of coupler knuckles | 39 ft. |
| Weight on driving wheels | 86,000 lb. |
| Weight, total engine | 124,000 lb. |

Two dynamotors are mounted on each locomotive. These operate the compressor and blowers and supply the required amount of 600-volt direct current for



Interior Views Showing Contactor and Cab Equipment Layout of 1200-Volt D.C. Locomotive

is mounted in a grounded expanded metal cage which protects the apparatus and yet allows it to be accessible for maintenance and inspection.

It will be noted that the reversers or series parallel switches are placed next to the floor, the switch groups and line switches directly over them, and the resistors directly over the switch groups under the roof. The grid resistors are mounted in the main cab over the switch groups and are enclosed in a steel cabinet open at the bottom and provided with hinged doors on each side so as to secure easy access. Ventilators are provided in the roof over the resistance cabinet. Forced ventilation is supplied by blowers mounted on the extended shaft of the dynamotors. The air-brake distributing valve is conveniently located inside the cab where it will be kept sufficiently warm to prevent freezing.

The control apparatus of each locomotive consists in general of the following: Two master controllers, two switch groups, two change-over switches, two control

lighting the passenger cars, the locomotive, headlight and for operating the control. Each compressor has a capacity of 35 cu. ft. of free air per minute.

The air brakes, built by the Westinghouse Air Brake Company, are of the type EL especially designed for electric locomotive service. Each locomotive is also equipped with a hand brake for holding the locomotive when stored.

The "near side" stop is attacked in a petition of residents of Independence, Mo., in which city officials were asked to take up with the Metropolitan Street Railway, Kansas City, Mo., which operates in Independence, the question of changing to "far side" stops. The request, however, was due to local conditions. Parkways between the curbing and pavements are said to have been damaged by persons boarding cars under the "near stop" conditions. Where far stops are observed, the passenger is in line with the entrance to the car from the sidewalk crossing and thus need not cross the parkway.

LONDON LETTER

(From Our Regular Correspondent)

The annual dinner of the Tramways & Light Railways Association was held in March. Viscount Chilston, the newly-elected president of the association, presided. Harry England, vice-chairman of the association, proposed the toast of "Our Guests," among whom were included representatives of the tramway officials of the Board of Trade and of the Municipal Tramways Association. He stated that the Municipal Tramways Association and the Tramways & Light Railways Association now worked together and that the feeling that existed between the associations some years ago had entirely disappeared. The toast was responded to by Alderman H. Linsley, president of the Municipal Tramways Association, who stated that it was diplomatic to invite representatives of the Board of Trade, as that was the one department with which they all ought to be on good terms. Alderman Rodgers, Newcastle, also responded to the toast, and extended a hearty welcome to the members of the association, which is to hold its next meeting in Newcastle. The toast of "The Tramways & Light Railways Association" was proposed by J. M. Henderson, who pointed out that there were 286 tramway systems, either company or municipally owned, with 2626 miles of track, the capital amounting to £80,000,000 and the gross annual receipts to £15,000,000. In replying to the toast the chairman spoke of the useful work that both associations had performed in the Houses of Parliament. He expressed disappointment, however, at the recent decision of the House of Lords on the rating question. He stated that they had a warm corner in their hearts for the Board of Trade, and thanked the Postmaster-General for his work in regard to the question of guard wires. He concluded by expressing the hope that the relations of the associations with all the government departments would continue to be of the same friendly character. Arthur Stanley proposed the health of the chairman. This concluded the proceedings, outside of the excellent musical entertainment which had been provided.

The total number of bills deposited in Parliament for the session of 1914 relating to railways, tramways, railless electric traction, etc., and the supply of electricity, gas and water, is 112, as compared with ninety-four of the session of 1913, while the total amount of money proposed to be raised is £19,666,170, as compared with £21,148,410 in 1913, a decrease of £1,482,240.

The Stalybridge, Hyde, Mossley and Dukinfield tramways committee has decided to abolish halfpenny fares on its tramway system except for children entitled to half fares. In the future children between the ages of three and fourteen are to be allowed to travel at half fare. Heretofore the provision in regard to children riding for half fare has applied to those between the age of three and twelve years.

In his speech at the meeting of the Bristol Tramways George White made it clear that the company means to oppose the Bristol Corporation bill for the purchase of the tramways. The chairman referred to the rapid and remarkable development of the motor bus traffic and the charabanc services. The motor bus services are to be further augmented in response to the popular demand, and the summer services of the long distance charabancs are evidently to be increased in the near future.

The Hove Town Council, in reply to a communication from the Brighton authorities, has passed a resolution expressing the opinion that it would be to the best interests of the two towns to test the overrunning system of railless traction. Until this had been done the Council could not agree to arbitration. Having adopted the under-running system, Brighton favors the appointment of an arbitrator to determine what system should be adopted for the authorized through routes. The representatives of Brighton have pointed out that the overrunning system is unsuited to the conditions there, owing to the necessity of crossing certain tramway tracks.

The examiners of private bills have received official intimation of the withdrawal of the bill under which Parliament was asked to incorporate a company to construct

an electric railway under the River Tyne between Tyne-mouth and South Shields.

The Liverpool tramways committee has decided to equip the tramway system with automatic point controllers, such as the one in operation opposite the Town Hall. Vacancies will be found in the carhouses for the boys now engaged as point attendants. The controller which is to be installed will be of the Collins type.

The London County Council is seeking the support of the local authorities to an increase in the speed of the tramcars, and after this has been obtained will approach the Board of Trade for consent. A speed of 16 m.p.h. is permitted on a few routes, and the Council is anxious to have the 12 m.p.h. routes scheduled for the higher speed. The borough councils, however, do not appear to be willing to acquiesce to the proposal.

The report of the Underground Electric Railways, Ltd., London, shows a satisfactory increase, but it is interesting chiefly for facts which it gives in regard to the company's construction work. The work which has been in progress at the Charing Cross station of the Metropolitan District Railway is almost finished, and the new escalators are already in service connecting this railway with the Bakerloo tube which passes underneath. The escalators connecting with the Hampstead tube, which has been extended from the vicinity of the Strand by means of a loop underneath Charing Cross station, will be in service soon. Flying junctions have been constructed at Earl's Court, which will greatly facilitate train movement at that point. The extension of the Bakerloo tube from Edgeware Road to Paddington was opened in December, 1913, and the traffic is developing satisfactorily. Escalators are being installed on this line at Oxford Circus and Baker Street stations. The construction of the Queen's Park extension of the Bakerloo Railway, by means of which access will be had to the main line of the London & North Western Railway when trains will run from the whole tube system of London as far north as Watford, is also well under way and should be completed this year. Work has also been commenced on the extension of the Central London Railway from Wood Lane to connect with the Ealing and Shepherd's Bush line of the Great Western Railway. The City & South London Railway, also controlled by the Underground company, shows a slight falling off in the receipts, but after the tunnels of this railway have been enlarged, so as to allow intercommunication of rolling stock, it is expected that the traffic will increase.

The Metropolitan Railway is bettering its service to Harrow, and is preparing to extend to Richmond. The London & North Western Railway refers in its annual report to the electrification to Watford in conjunction with the Bakerloo Railway, and also in conjunction with the North London Railway which will bring the electrified lines into Broad Street station in the city. Nearly £2,500,000 will be spent by the London & North Western Railway during 1914, of which the new power station at Stonebridge Park will absorb more than £500,000. The London, Brighton & South Coast Railway reports excellent results due to its policy of electrification of its suburban lines. This company is pushing on with the electrification of the suburban services and hopes to complete the section from Balham through Streatham Common, Norbury and West Croydon to Wallington by the end of this year. Other sections will then be taken in hand as quickly as possible, and it is hoped that the complete electrification of the company's suburban lines will be finished within a period of four years.

The Midland Railway reports that it is now widening the line on certain portions of its route between London and Tilbury in preparation for electrification. The company is asking for power to issue £1,000,000 of new capital. The London & South Western Railway is engaged in the work of electrifying the Thames Valley branches and the necessary main lines connecting the suburban area with its huge new station at Waterloo.

The board of trade of Swansea has, after considerable agitation, consented to the construction by the Corporation of the Mount Pleasant Light Railway. The new line will have one of the steepest grades in England.

News of Electric Railways

Rapid Transit Developments in Philadelphia

On March 25 the Philadelphia Rapid Transit Company submitted to the special committee on rapid transit of Philadelphia a plan under which the company would agree to operate the additional rapid transit lines proposed in a report recently issued by the city. These include (1) an elevated railway to Frankford to be built by the Rapid Transit Company and operated as an extension to the Market Street Elevated service; (2) a tube under the Delaware River to be built by interests holding that franchise, this line to be leased to the Rapid Transit Company and operated as an extension to the Market Street Elevated service with an additional fare of 3 cents therefor; and (3) additional subway and elevated lines, including the Broad Street subway and the Chestnut Street subway-Darby elevated, to be built by the city and operated by the company with free transfers between the surface lines.

In this connection the company pointed out that at present it is making a charge of 3 cents for transfers between surface cars (or exchanges, as they are called at Philadelphia) at a great many points and that this rate of fare is protected by the contract between the company and the city, dated July 1, 1907. An analysis of the receipts of the company shows that it is absolutely dependent upon the revenue from this exchange charge.

The sum produced by this extra 3-cent charge for exchange tickets during the last three fiscal years was as follows: 1911, \$739,296; 1912, \$774,764; 1913, \$794,264; and the same rate of increase (4 per cent) gives the figures: 1914, \$826,024; 1915, \$859,075; 1916, \$893,438. The company says that if it puts a free transfer system in operation, as has been advocated by the Council, it should be compensated for the elimination of the returns from the 3-cent exchange ticket and suggests as a means by which this could be accomplished that it should be relieved of (1) the annual payment in lieu of repaving streets, at present about \$500,000; (2) the annual payment to the city for tax on dividends of certain of the underlying companies, now approximating \$115,000; and (3) the annual payment into the sinking fund under the contract of July 1, 1907, at present \$120,000. The total of these various items amounts to the sum of \$735,000.

As the problem for the fiscal year, 1915, is to compensate for a loss of \$859,000, there would still remain a deficit of \$124,000 which the Rapid Transit Company would be obliged to overcome by economy in operation and by rerouting and combining certain lines to meet the new conditions arising from the enlargement of the transfer privilege. The company would, in this event, resume payments into the sinking fund in 1924, upon a basis which, if the contract were extended for an additional period of seven years, would produce the sum of \$30,000,000, with which the city could purchase the capital stock of the Rapid Transit Company at the termination of the contract. In the same statement it also outlines the other conditions under which it will agree to operate the rapid transit lines which have been proposed for construction.

A. Merritt Taylor, transit director of the city, opposed the proposition made to the city by the Rapid Transit Company and has summarized the main points of difference between the city and the company in the following comparative table:

| P. R. T. PROPOSITION | TENTATIVE SUGGESTIONS OF THE DEPARTMENT OF CITY TRANSIT |
|---|---|
| COMPANY'S INVESTMENT—ESTIMATED COST | COMPANY'S INVESTMENT—ESTIMATED COST |
| Frankford elevated, structure \$6,510,000 | Frankford elevated, structure \$6,510,000 |
| Frankford elevated, equipment 2,402,000 | Frankford elevated, equipment 2,402,000 |
| Total \$8,912,000 | Broad Street subway, equipment.. 7,393,000 |
| | Chestnut - Darby, equipment 2,045,300 |
| | Total \$18,350,300 |
| (Company to secure lease of Camden tube, costing \$6,000,000 in 5 per cent bonds, and ownership thereof to be vested in P. R. T.) | (Company to secure lease of Camden tube, costing \$6,000,000 in 5 per cent bonds, and ownership thereof to be vested in P. R. T.) |

| CITY'S INVESTMENT | CITY'S INVESTMENT |
|---|---|
| Broad Street subway, structure.. \$34,682,000 | Broad Street subway, structure.. \$34,682,000 |
| Broad Street subway, equipment.. 7,393,000 | Chestnut subway-Darby elevated, structure (note) 12,810,000 |
| Chestnut subway-Darby elevated, structure (note) 12,810,000 | Chestnut subway-Darby elevated, equipment (note) 2,045,300 |
| Chestnut subway-Darby elevated, equipment (note) 2,045,300 | Total \$47,492,000 |
| Total \$56,930,300 | |

NOTE: P. R. T. takes the position that Market Street elevated line has insufficient reserve capacity to justify the temporary operation of the Darby elevated service through Market Street, and positively refuses to make the necessary arrangement therefor. If this be final, the Darby elevated cannot be built until traffic conditions justify the building of the Chestnut Street subway.

| | |
|--|--|
| METHOD OF OPERATION Company to operate all city-built and city-equipped lines on the following basis: | METHOD OF OPERATION Company to operate all city-built lines on the following basis: |
|--|--|

1. From net earnings deduct:
 - (a) No company investment in equipment under this plan.
 - (b) Preferential payment for decrease in company's net income of year prior to operation of city-built line, viz.: year ending June 30, 1918.
 - (c) Interest and sinking fund on city's investment, cumulative.
 2. Divide balance of surplus earnings between city and company (half and half).
 3. Outside of delivery district free transfers with all surface lines at points of intersection at stations, and also with other rapid transit lines; division of fare to be 2½ cents to city and 2½ cents to company.
 4. When city builds Chestnut subway - Darby elevated line, company to operate it with Frankford elevated line as a through line on above basis, company to be allowed 6 per cent return on its investment in Frankford line.
1. From net earnings deduct:
 - (a) Interest on company's investment therein at 6 per cent, cumulative.
 - (b) For the first five years of operation of each city-built line, but not thereafter, a preferential payment to equal the net decrease, if any, in the net income of the company derived from all its surface lines and its rapid transit lines below the actual net income for year to June 30, 1914, which decrease is caused solely by the diversion of traffic by such city-built lines. Amount of this preferential payment, or payments, not to exceed \$500,000 in any one year. In case of disagreement as to amount of preferential payment, question to be arbitrated by one representative each of city, company and public service commission, whose findings shall be subject to review and final decision by the public service commission.
 - (c) Interest and sinking fund on city's investment, cumulative.
 2. Divide balance of surplus earnings between city and company in proportion to their relative investment in all new rapid transit lines.
 3. Free transfers between all surface lines and new rapid transit lines (Camden excepted) at points of intersection at stations, division of fare to be 3 cents to city and 2 cents to company; and also with other rapid transit lines, division of fare to be 2½ cents to city and 2½ cents to company; such free transfers to be regulated to such extent only as may be necessary to protect the interests of the public.
 4. When the city builds Chestnut subway-Darby elevated line, company to operate it with Frankford elevated line as a through line on above basis, and the earnings on Frankford-Chestnut-Darby Line to be divided on above basis.
 5. City to have right to require company to operate on above basis additional rapid transit lines or extensions which the city may from time to time build and equip.
 6. The profit from Camden tube, at 3-cent fare, the 2 cent payment to surface lines for transfers and preferential payment to compensate for surface losses.

- 7. City to have right to require company to extend its existing surface system from time to time as the Public Service Commission may determine to be necessary for public convenience.
- 8. 1907 contract to be extended for seven years. In future division of earnings provided under contract, city to receive during last seven years of extended contract and thereafter (if property is not purchased at expiration of extended term) all surplus earnings over 6 per cent on par value of P. R. T. stock.

Note:—City to be permitted to capitalize its interest and sinking fund accruals to end of first year of operation. Company to be permitted to capitalize its interest accruals to end of first year of operation. Such accruals as are capitalized shall not be taken out of earnings.

UNIVERSAL TRANSFERS.

Beginning Oct. 1, 1914, company to discontinue 3-cent exchange tickets and establish outside of central delivery district universal free transfers between surface lines and between surface and rapid transit lines.

To compensate company for annual loss of revenue from exchange tickets, which amounted to \$803,108 for year to June 30, 1913, city to amend 1907 contract as follows:

- 1. Extend expiration of contract for seven years from 1957 to 1964.
- 2. City to waive annual payments in lieu of repairs of paving and license fees, amounting to upward of \$500,000 per year, and also tax on dividends of subsidiary companies of about \$116,000 per year.
- 3. Present sinking fund payments of \$120,000 per annum to be suspended for next ten years and thereafter to be so graded as to extinguish par value of company's stock in remaining forty years.

Letters of E. T. Stotesbury and T. E. Mitten to the board of directors of the Philadelphia Rapid Transit Company, in which they agreed a new and broader financial plan should be adopted by the company to meet the new situation caused by negotiations with the city, have been made public by the company. These letters were read and considered at the meeting of the board on March 25, prior to the meeting of the company and city representatives at which Mr. Taylor objected to the terms proposed by the company. The letter from Mr. Stotesbury was accompanied by a letter from Mr. Mitten to him. Mr. Stotesbury pointed out that the city's elevated and subway development plans necessitated the company's co-operation, or, in the absence of that, of meeting such active competition as would follow the construction and operation of such additional lines. He observed that even though expected earnings materialized the possibility of competition would make it impossible to sell new securities based solely upon the company's credit.

Mr. Mitten, in his letter to Mr. Stotesbury, submitted the following tables of the earnings of the company during the Stotesbury management, as compared with the year immediately preceding that management:

| Year ended June 30 : | 1914 | 1913 | 1912 | 1911 |
|---|--------------|--------------|--------------|--------------|
| Estimate: (12 months) | | | | |
| Gross earnings | \$23,525,000 | \$22,625,000 | \$21,750,000 | \$20,900,000 |
| Operation | 14,682,000 | 14,140,625 | 13,593,750 | 13,062,500 |
| | \$8,843,000 | \$8,484,375 | \$8,156,250 | \$7,837,500 |
| Fixed charges | 8,843,000 | 8,768,000 | 8,573,000 | 8,489,500 |
| *Deficit | | *\$283,625 | *\$416,750 | *\$652,000 |
| Actual (8 months) | | | | |
| Gross earnings | \$16,025,074 | \$23,927,179 | \$22,700,692 | \$21,529,469 |
| Operation | 9,434,982 | 14,205,755 | 13,948,831 | 13,149,060 |
| | \$6,590,092 | \$9,721,424 | \$8,751,861 | \$8,380,409 |
| Fixed charges | 6,401,075 | 9,211,841 | 8,902,350 | 8,795,969 |
| Surplus—*Deficit | \$189,017 | \$509,583 | *\$150,489 | *\$415,560 |
| Increase in gross earnings—Estimated, 4 per cent per annum; actual, 4.5 per cent. Operating ratio—Estimated 62.5 per cent gross; actual, 60.2 per cent. | | | | |

Continuing, Mr. Mitten said:

"The surplus earnings for the eight months ending Feb. 28, 1914, amount to \$189,017, as against \$186,476 for the same period of the previous fiscal year. Presuming that the results for the full year ended June 30, 1914, be not less than for the preceding fiscal year, there will then have been a net surplus of approximately \$500,000 during the four years, as against an estimated total deficit of \$1,352,375.

"The capital expenditures follow:

| | |
|--|--------------|
| Total capital expenditures three years to June 30, 1914. | \$14,000,000 |
| As the original plan of financing was enlarged by the authorization of two car trust agreements, the certificates outstanding thereunder are for the purpose of this comparison, here deducted | 5,888,000 |
| | \$8,112,000 |

| | |
|--|-------------|
| This net total of capital expenditures being covered by 1912 5 per cent bonds provided therefor, as follows: | |
| Issued and outstanding | \$5,028,000 |
| In treasury | 972,000 |
| Available for use during year commencing March 1, 1914 | 2,000,000 |
| | \$8,000,000 |

"There then remain \$2,000,000 of the 1912 5 per cent bonds available for the capital expenditures during the two years ending June 30, 1916. It would have been recommended that at least the major portion of this amount should be expended during the next fiscal year ending June 30, 1915, this in order that the beneficial effect from the total authorized expenditures be so much sooner realized by the public."

Bids for Subway Construction in New York

The Public Service Commission for the First District of New York has opened bids for the construction of the section of the Eastern Parkway subway, Brooklyn, known as Section No. 1-A of Route No. 12, in Flatbush Avenue between St. Marks Avenue and the Prospect Park Plaza. For the greater part of the distance the structure will be a six-track subway. Four tracks are to be used by the Interborough Rapid Transit Company for the Eastern Parkway subway, and the other two tracks will be used by the New York Municipal Railway Corporation to connect the Fourth Avenue subway with the Brighton Beach Railroad. According to unofficial figures the lowest bidder for the construction of this section was the Cranford Company, Brooklyn, at a total of \$2,225,520. The next lowest bidder was the Litchfield Construction Company, at \$2,330,000, and the third was the Mason & Hanger Company at \$2,498,000. The contract was subsequently awarded by the commission to the Cranford Company.

Mr. McKinley's Welcome Home

William B. McKinley, president of the Illinois Traction System, who returned to his home in Champaign, Ill., on March 25, 1914, after a seven-months' tour around the world, was accorded a reception by the citizens of Champaign-Urbana and the students of the University of Illinois upon his arrival in his home community. Mr. McKinley's private car was run over the Illinois Traction System to Danville to meet him. Dinner was served on the return journey. The car reached Urbana at 6.40 p. m., and at the courthouse square in Urbana a reception was held and the guest made a brief address. The special car then proceeded to the campus of the University of Illinois, about 1 mile to the west, and Mr. McKinley and his party alighted from the private car and with the University band leading a line of march was formed to the University Armory. Here David Kinley, vice-president of the university and professor of economics, presided. The mayors of both cities, the presidents of the commercial organizations, representatives of various student organizations, the president of the University Young Men's Christian Association, a representative of the Urbana high school and a number of other speakers welcomed Mr. McKinley. The McKinley party then entered automobiles and were driven to the McKinley home in Champaign. The closing part of the program was held from the front porch of the McKinley home in the presence of 3000 people who assembled on the lawn.

As Mr. McKinley landed at New York he was handed a silver tube containing an invitation signed by about 400

citizens of Decatur asking that he come to their city. Mr. McKinley and his party accordingly proceeded to Decatur on the evening of March 26. The reception at the Decatur Club was almost as large and enthusiastic as was the one in Champaign-Urbana.

The London County Council Tramways

The report of the London (England) County Council issued recently contains an elaborate review of the tramway undertakings of the Council. A table was published showing the position of the tramways in London during the year ended June 30, 1889, a few months after the Council came into being. The total length of route line at that time was 129 1/8 miles, the total paid-up capital £3,478,126, the working expenditures £722,983, the net receipts £213,533 and the number of passengers, 169,120,000.

The following table shows the progress made with the electrification and extension of the system:

| Year | Elec- tric (in Opera- tion) at End of Year, Route Miles | *Horse Lines in process (including or Re- construction) at End of Year, Route Miles | Approximate Total, Route Miles | Remarks |
|---------|---|---|--------------------------------|---|
| 1902-3 | Some lines undergoing reconstruction | | | |
| 1903-4 | 19 3/4 | 88 5/8 | 88 5/8 | First electric tramways opened for public traffic on May 15, 1903. |
| 1904-5 | 26 5/8 | 68 3/4 | 95 3/8 | Includes 3/8 mile in Archway Road worked by Metropolitan Electric Tramways. Includes 3/8 mile in Archway Road worked by Metropolitan Electric Tramways, and 3/8 mile in Leabridge Road worked by Leyton Urban District Council. |
| 1905-6 | 30 3/8 | 73 3/8 | 104 | |
| 1906-7 | 58 3/8 | 57 3/8 | 116 3/4 | |
| 1907-8 | 68 3/8 | 51 3/8 | 120 3/8 | |
| 1908-9 | 85 3/4 | 42 3/8 | 128 1/8 | |
| 1909-10 | 116 1/4 | 19 1/4 | 135 3/8 | Includes 2 miles in Archway Road and Harrow Road worked by Metropolitan Electric Tramways and 3/8 mile in Leabridge Road worked by Leyton Urban District Council. |
| 1910-11 | 127 5/8 | 16 5/8 | 144 1/4 | Includes 3 1/8 miles in Archway Road and Harrow Road worked by Metropolitan Electric Tramways. |
| 1911-12 | 132 5/8 | 13 5/8 | 146 1/4 | Do. |
| 1912-13 | 138 3/4 | 9 1/2 | 148 1/4 | Do. |

The rolling stock in each year from and including 1903 was as follows:

| Year | Electric Cars | Horse Cars |
|---------|---------------|------------|
| 1902-3 | — | 517 |
| 1903-4 | 306 | 290 |
| 1904-5 | 401 | 227 |
| 1905-6 | 414 | 216 |
| 1906-7 | 671 | 723 |
| 1907-8 | 965 | 621 |
| 1908-9 | 1170 | 516 |
| 1909-10 | 1326 | 127 |
| 1910-11 | 1551 | 107 |
| 1911-12 | 1584 | 96 |
| 1912-13 | 1676 | 74 |

The following table shows the number of passengers and the total receipts for the last eleven years:

| Year | Passengers | Total Receipts |
|---------|-------------|----------------|
| 1902-3 | 109,615,496 | 444,698 |
| 1903-4 | 133,139,085 | 536,239 |
| 1904-5 | 164,818,560 | 682,095 |
| 1905-6 | 183,512,421 | 782,210 |
| 1906-7 | 314,227,090 | 1,414,604 |
| 1907-8 | 372,515,754 | 1,663,031 |
| 1908-9 | 412,913,841 | 1,847,451 |
| 1909-10 | 451,439,216 | 2,023,004 |
| 1910-11 | 504,715,300 | 2,232,818 |
| 1911-12 | 533,440,235 | 2,356,181 |
| 1912-13 | 512,652,700 | 2,251,729 |

The cost of reconstructing the tramways for electric traction is charged to capital account and, in accordance with the usual practice, repayment is spread, as regards lands and buildings, over sixty years, and as regards permanent way, cars, machinery and other short-lived items, over twenty-five years. In 1908 the Council decided that provision at the rate of 2-3d. a car mile would be sufficient, but that the adequacy of the provision should be reconsidered in five

years' time. At the same time the Council, as an additional precaution, decided that for five years from April 1, 1908, any surplus after providing for renewals at the rate of 2-3d. a car mile should be set aside for general contingencies. The title of the "renewals reserve fund" was altered to "renewals fund" and the new temporary fund was named the "general reserve fund." The amounts credited to these funds in each year since 1907-8 are as follows:

| Year | Renewals Fund | General Reserve Fund |
|---------|---------------|----------------------|
| 1907-8 | £51,329 | £34,634 |
| 1908-9 | 107,570 | — |
| 1909-10 | 132,231 | 59,878 |
| 1910-11 | 129,229 | 103,198 |
| 1911-12 | 138,152 | 84,551 |
| 1912-13 | 497 | — |

The number of car miles run in recent years on the Council's tramways at workmen's fares, and the number of passengers on these cars follow:

| Year | Car Miles | Number of Passengers |
|---------|-----------|----------------------|
| 1906-7 | 2,200,090 | 19,528,799 |
| 1907-8 | 3,408,985 | 27,977,412 |
| 1908-9 | 3,948,168 | 32,083,034 |
| 1909-10 | 4,450,142 | 36,354,226 |
| 1910-11 | 5,169,237 | 42,380,597 |
| 1911-12 | 5,439,026 | 47,571,105 |
| 1912-13 | 5,822,713 | 49,695,801 |

Electrification References at British Railway Meetings

Generally speaking, it may be stated that at the annual meetings of British railway companies this year the chairmen have given more particulars to the public than usual and the trend of their remarks has been in favor of electrification. This undoubtedly has been brought about by the successful electrification scheme of the underground railways of London, and by the severe competition of motor omnibuses, electric tramways and tube railways. The experience of the Brighton Railway has also helped to show the other railways what may be expected from electrification of suburban lines, and there now remain only a very few railways with terminals in London which have no electrification scheme in hand. One of these is the Great Eastern Railway, which recently appointed H. W. Thornton, late of the Long Island Railroad, as its general manager. An electrification scheme will probably be evolved there.

Some of the railways which do not reach London are also busy with electrical schemes, and the Northeastern Railway in its annual report refers to the electrification of the mineral lines between the Shildon and Newport sidings, a distance of 18 miles. The cost of this work, including the provision of ten locomotives, is estimated at £150,000. The first of the locomotives is almost finished, and the work of equipping the lines is well in hand. It is expected that the system will be ready for operation by electricity by the end of the year. The Lancashire & Yorkshire Railway is engaged with the electrification of its line from Manchester to Bury, on the same system precisely as on the electric railway between Liverpool and Southport. Meantime, the high-tension electrified line in the vicinity of Bury is attracting attention, and though no formal description of it is yet available it is understood that the results have been satisfactory.

With regard to the electrification scheme which the London & Southwestern Railway has in hand, it is interesting to note that it has been decided to remodel the existing railway carriages for electric operation. The regular electric train will be composed of two motor cars and a trailer. Six-coach trains will be run during the rush hours. The leading motor coaches will terminate in a pointed end for the purpose of diminishing wind resistance.

The York Corporation is confronted with a difficult problem in endeavoring to provide adequate tramway services without destroying the features of this historic town. The intra-mural streets, with few exceptions, are narrow and congested, but they contain many fine examples of medieval domestic architecture. The existing tramway system pierces the walls only once. It is now proposed to extend the system from near the center of the city to the Hull Road district, a thickly populated area on the north-eastern side of York lying outside the walls. The proposed new route will pass along Walmgate to Walmgate Bar, the only gate in the city to retain its barbican, but the old gateway will not be interfered with, as a single line will pass through an arch at the side of the bar, built many years ago under a street improvement scheme.

*The northern tramways, about 48 miles in length, were worked by the North Metropolitan Tramways under lease up to April 1, 1906.

H. M. Bylesby on Depreciation

In the recent annual report of the Northern States Power Company, H. M. Bylesby, president of the company, gives the following interesting discussion concerning the manner of appropriating amounts out of the earnings of public utilities for depreciation:

"All of the properties of the company have been fully maintained to 100 per cent efficiency. The cost of this maintenance has been charged to operation. Beyond this no arbitrary charge has been made out of current earnings to represent any accruing depreciation which has not become evident, except in certain particular instances amounting to the sum of \$67,861. The question of an allowance for accruing depreciation beyond the full maintenance of the property is one which is under discussion at the present time and upon which the most divergent views are expressed by operating officials. On the one hand, it is contended that beyond maintenance to 100 per cent efficiency no further arbitrary depreciation should be charged. On the other hand, it is contended that in addition to the full maintenance a certain definite allowance for accruing depreciation should be made. The amounts so to be allowed, whether based on percentages of gross income or percentages of depreciable value of the property, vary from the smallest amounts to amounts which are far beyond the possibilities of any property to sustain with present rates.

"In the meantime, no distribution has been made on the common stock of the Northern States Power Company since its formation. The earnings which have accrued on the operating statements as applicable to that purpose have been reinvested in the plant and extensions to the service. This policy will be continued until such time as a more definite program as to depreciation has been generally adopted by public service companies similarly situated or until, by the establishment of public utility commissions in the states wherein the company operates, more definite rules on this subject are laid down for the guidance of the officers. Then the officers will put into effect in this property a working plan for the definite providing of accrued depreciation beyond the full maintenance which the properties always have.

"Certain of the real estate holdings of the company have increased pronouncedly from the general appreciation in values in their vicinity. These appreciations in value should be taken into account in any consideration of the more or less academic question of accruing depreciation where properties have been fully maintained."

Increase in Wages in Danville.—The Danville Street Railway & Light Company, Danville, Ill., has granted an increase in pay to the street railway employees. All three-year men will receive \$2.30 a day; two-year men, \$2.20 a day and one-year men, \$2.10 a day. The increase amounts to 10 cents a day.

New Oregon Road Placed in Operation.—The line of the Southern Oregon Electric Railway in Medford, Ore., was placed in operation on March 20, 1914. C. G. Bullis, the manager of the company, has announced that work will be begun this month on the construction of a 2-mile extension through Medford to Siskiyou Heights.

Third Arbitrator for Middlesex & Boston.—George L. Mayberry, Waltham, Mass., has been selected as the third member of the special arbitration board which will sit in the wage dispute between the Middlesex & Boston Street Railway and the local branch of the Amalgamated Association. An increase of from 6 cents to 7 cents an hour is sought by the men.

Appeal of Montreal Tramways Dismissed.—The Court of King's Bench, Montreal, has dismissed an appeal of the Montreal Tramways from the decision of the Quebec Public Utilities Commission ordering it to give details of the working of the company. The contention of the company was that the commission had no jurisdiction, but the court held that the commission had ample powers.

Reported Electrification of Steam Line Between Warren and Youngsville.—The statement was made in Buffalo a few days ago that the Dunkirk, Allegheny Valley & Pittsburgh Railway, which is controlled by the Lake Shore &

Michigan Southern Railway, will be electrified between Warren, Pa., and Youngsville, a distance of 9 miles. That this work will be carried out in the near future is unlikely as no provision for it has been made in the current expenditures of the company.

Abandonment of Car Building Plans for New Orleans.—The New Orleans Railway & Light Company, New Orleans, La., has abandoned the plan which it has had under consideration for some time to build all its own cars and will shortly place an order for fifty new cars. Until recently the company built eight or ten cars a year at its own shops. When the need of new cars became apparent recently, J. S. Pevear, vice-president of the company, had a number of plans prepared and submitted them to W. B. Thompson, head of the department of public utilities of the city, with the end in view of adopting a type of construction which would be satisfactory to the officials of the city.

Presentation of Toronto Purchase Agreement Postponed.—Mayor Hocken of Toronto, Ont., explained to the City Council on March 23, 1914, the absence of the agreement for the purchase of the property of the Toronto Railway and the Toronto Electric Light Company by the city. The agreement was to have been presented on that day. He said that in spite of the efforts of the Board of Control and the Corporation Counsel it was impossible to complete the agreement in time for the meeting. The work was progressing satisfactorily, although the power contract was very intricate. The Mayor said that the Corporation Counsel had informed him that with the settlement of the power contract and the conditions governing the entrance of radial electric railways the agreement could be completed within forty-eight hours.

Special Public Utilities Number.—The New York *Evening Post* published on Monday, March 30, 1914, its first public utilities supplement and announced that it will inaugurate the policy of giving regularly greater recognition than hitherto "to the industries and investment activities which have come to be included under the general title of public utilities." The supplement was divided into two sections of fourteen pages each and contained many signed articles on different phases of public utility work. Among the contributors to the supplement who are well known in the electric railway field were James E. Sague of the Public Service Commission for the Second District of New York; Alexander C. Humphreys, president of Stevens Institute; Paul Leake of the American Public Utilities Company; F. W. Stevens, formerly chairman of the Public Service Commission of the Second District of New York; Francis T. Homer of Bertron, Griscom Company; C. Loomis Allen of Allen & Peck, Inc.; Francis T. Blossom of Sanderson & Porter; Edwin Gruhl, assistant to the president of the North American Company; George Williams of Henry L. Doherty & Company; Arthur Williams of the New York Edison Company; Stephen L. Coles of the Society for Electrical Development, Inc., and Henry G. Bradlee of Stone & Webster.

Spread of Workmen's Compensation Legislation.—The rapidity with which compensation laws are superseding employers' liability laws as a method of dealing with the results of industrial accidents is indicated in bulletin No. 126 of the Bureau of Labor Statistics entitled "Workmen's Compensation Laws of the United States and Foreign Countries." This bulletin recounts the activities of the twenty-eight commissions appointed in this country to consider the subject, in so far as reports were made, and reproduces the text of the laws of the twenty-three States which have enacted such legislation, besides the federal statute, the executive order relative to the canal zone, and the railway employees' bill that was before the Sixty-second Congress. Accounts of the operations of the laws and of their construction by the courts are also given. The laws of their respective States have been declared constitutional by the courts of last resort in Massachusetts, New Jersey, Ohio, Washington and Wisconsin, though in Montana and New York the opposite result was reached; in Montana because of the presence of an unessential feature of the law that permitted double liability, while in New York the principle of the law was held to be in conflict with the constitution of the State. The constitution was amended last year and a law enacted to express the will of the people.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

MASSACHUSETTS.

The committee on street railways has recommended that the petition for the consolidation of the Connecticut Valley Street Railway and the Northern Massachusetts Street Railway be referred to the next Legislature. The committee has sent in adverse reports upon the bill extending the jurisdiction of laws relating to street railways to trackless trolley companies; upon the Niland bills providing for the purchase of the Boston Elevated Railway by the State, and upon the bill prohibiting the operation of elevated or street cars in which the payment of fare is required before the passenger enters the main body of the car. The committee on metropolitan affairs has reported no legislation necessary on the special reports of the Boston Transit Commission regarding the removal of the elevated structure on Washington and Main Streets and the construction of a station at Bennett Street, in the Washington Street tunnel. Several bills to prohibit the overcrowding of street cars are now before the committee on street railways. Among the bills favoring public ownership is an American Federation of Labor measure calling for the purchase by the State of all the street and electric railways within the commonwealth.

NEW YORK

The Legislature adjourned on March 28, 1914. Failure of the two branches to agree upon financial legislation has made it necessary for Governor Glynn to call an extraordinary session. In the closing hours the Governor sent to the Senate for confirmation the names of William Temple Emmett and Frank Irvine for appointment to the Public Service Commission of the Second District and of George M. Schulz for appointment to the Public Service Commission for the First District. These nominations were all confirmed. Assemblyman Simpson's bill to amend Greater New York's charter authorizing the comptroller of the city of New York to issue corporate stock notes in anticipation of tax collections to cover expenditures for public improvements which are to be apportioned among the budgets for ensuing years, was passed by both Houses and sent to the Governor. The Sullivan bill calling for two men to act as crew on every street car operated in the State was lost in the Assembly by a vote of sixty-three to sixty-two.

PROGRAM OF ASSOCIATION MEETING

Association of Railway Telegraph Superintendents

The annual convention of the Association of Railway Telegraph Superintendents will be held at New Orleans, La., on May 19, 1914. M. H. Clapp, superintendent of telegraph of the Northern Pacific Railway, St. Paul, Minn., who is chairman of the topics committee of the association, has announced the following program of papers for the meeting:

Paper, "The Fitting of Applicants for Telegraph and Telephone Service on Railroads," by J. B. Sheldon, superintendent of telegraph of the Union Pacific Railroad, Omaha.

Paper, "The Organization for Clearing Storm Troubles; Including the Providing of the Necessary Material, Poles and Wires on Railroad Right of Way," by J. C. Hubbard, general supervisor of lines of the Western Union Telegraph Company, New York.

Paper, "The Organization of Gangs, Including Plans for Boarding the Men," by M. B. Wyrick, division plant superintendent of the Western Union Telegraph Company, Dallas.

Paper, "Unit Costs of Railroad Pole Line Construction, How Obtained and How Used," by V. T. Kissinger, superintendent of telegraph of the Chicago, Burlington & Quincy Railway, Chicago, Ill.

Paper, "The Use of the Printing Telegraph on Railroads," by Archibald Wray, assistant superintendent of telegraph of the Chicago, Rock Island & Pacific Railway, Chicago, Ill.

Paper, "The Transposition of Wires for Railroad Telephone, Physical and Phantom Circuits," by C. A. Robinson, of the engineering department of the American Telephone & Telegraph Company, New York.

Paper, "Maintenance of Telegraph and Telephone Equipment," by M. B. Overly, engineer telephone department of the Cleveland, Chicago, Cincinnati & St. Louis Railway, Indianapolis, Ind.

Financial and Corporate

Stock and Money Markets

April 1, 1914.

In the initial dealings on the New York Stock Exchange to-day there was moderate buying of international stocks, but the advances made in the early trading were lost in a gradual recession later in the day. The Gould railroad group was the most prominent feature in the afternoon trading. Toward the close the tone of the market improved and a number of issues made fractional advances. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2½ @ 2¾ per cent; four months, 3 @ 3¼ per cent; six months, 3 @ 3¼ per cent.

The local issues were not in demand to-day. Philadelphia Rapid Transit was offered at 17¼. The bond transactions totaled \$28,100, par value.

In Chicago the stock market to-day was narrow and the volume of sales small. The demand for bonds was good.

The market to-day in Boston was extremely dull and irregular. Small sales were recorded of Boston Elevated, Massachusetts Electrics and West End Street Railway.

The sales of stocks in Baltimore to-day totaled only 807 shares. The sales of bonds totaled \$50,000, par value.

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

| | Mar. 25 | Apr. 1 |
|---|---------|--------|
| American Brake Shoe & Foundry (com.) | 90½ | 88½ |
| American Brake Shoe & Foundry (pref.) | 138½ | 139 |
| American Cities Company (com.) | 36 | 36 |
| American Cities Company (pref.) | 65 | 63½ |
| American Light & Traction Company (com.) | 365 | 367 |
| American Light & Traction Company (pref.) | 107 | 107 |
| American Railways Company | 38¼ | 38 |
| Aurora, Elgin & Chicago Railroad (com.) | 42 | 42 |
| Aurora, Elgin & Chicago Railroad (pref.) | 77½ | 78 |
| Boston Elevated Railway | 82 | 7 |
| Boston Suburban Electric Companies (com.) | 7 | 63 |
| Boston Suburban Electric Companies (pref.) | a63 | 63 |
| Boston & Worcester Electric Companies (com.) | *6¼ | *6¼ |
| Boston & Worcester Electric Companies (pref.) | 37 | 37 |
| Brooklyn Rapid Transit Company | 92¼ | 92¾ |
| Capital Traction Company, Washington | 107½ | 104¼ |
| Chicago City Railway | 170 | a170 |
| Chicago Elevated Railways (com.) | 20 | 20 |
| Chicago Elevated Railways (pref.) | 65 | 65 |
| Chicago Railways, pteptg., ctf. 1 | 91 | 90 |
| Chicago Railways, pteptg., ctf. 2 | 30 | 30 |
| Chicago Railways, pteptg., ctf. 3 | 6 | 6 |
| Chicago Railways, pteptg., ctf. 4 | 2½ | 2½ |
| Cincinnati Street Railway | 105 | 106 |
| Cleveland Railway | 103¾ | 104½ |
| Cleveland, Southwestern & Columbus Ry. (com.) | *4 | *4 |
| Cleveland, Southwestern & Columbus Ry. (pref.) | *23 | *23 |
| Columbus Railway & Light Company | 13 | 13 |
| Columbus Railway (com.) | 53 | 53½ |
| Columbus Railway (pref.) | 79½ | 79½ |
| Denver & Northwestern Railway | 71 | 71 |
| Detroit United Railway | a80 | a80 |
| General Electric Company | 146¾ | 147 |
| Georgia Railway & Electric Company (com.) | 120½ | 121 |
| Georgia Railway & Electric Company (pref.) | 86¼ | 85¾ |
| Interborough-Metropolitan Company (com.) | 14¾ | 15¼ |
| Interborough-Metropolitan Company (pref.) | 60¼ | 60¾ |
| International Traction Company (com.) | *30 | *30 |
| International Traction Company (pref.) | *85 | *85 |
| Kansas City Railway & Light Company (com.) | 10 | *10 |
| Kansas City Railway & Light Company (pref.) | 25 | *25 |
| Lake Shore Electric Railway (com.) | *5½ | *5½ |
| Lake Shore Electric Railway (1st pref.) | *85 | *85 |
| Lake Shore Electric Railway (2d pref.) | *22 | *22 |
| Manhattan Railway | 130 | 130 |
| Massachusetts Electric Companies (com.) | 11 | 11 |
| Massachusetts Electric Companies (pref.) | 61½ | 61½ |
| Milwaukee Electric Ry. & Light Co. (pref.) | *95 | *95 |
| Norfolk Railway & Light Company | 25¼ | 25¼ |
| North American Company | 75½ | 78½ |
| Northern Ohio Traction & Light Co. (com.) | 70 | 70 |
| Northern Ohio Traction & Light Co. (pref.) | 98¼ | 101 |
| Philadelphia Company, Pittsburgh (com.) | 43 | 42½ |
| Philadelphia Company, Pittsburgh (pref.) | 42 | 40 |
| Philadelphia Rapid Transit Company | 18¼ | 17½ |
| Portland Railway, Light & Power Company | 54 | *54 |
| Public Service Corporation | 112 | 112 |
| Third Avenue Railway, New York | 43½ | 43½ |
| Toledo Traction, Light & Power Co. (com.) | 15 | a20 |
| Toledo Traction, Light & Power Co. (pref.) | 70 | a70 |
| Twin City Rapid Transit Co., Minneapolis (com.) | 105 | 104½ |
| Union Traction Company of Indiana (com.) | *11½ | *11½ |
| Union Traction Company of Indiana (1st pref.) | *80 | *80 |
| Union Traction Company of Indiana (2d pref.) | *14 | *14 |
| United Rys. & Electric Company (Baltimore) | 27¼ | 27 |
| United Rys. Inv. Company (com.) | 21½ | 20 |
| United Rys. Inv. Company (pref.) | 47½ | 48 |
| Virginia Railway & Power Company (com.) | 51 | 50 |
| Virginia Railway & Power Company (pref.) | 96 | 96 |
| Washington Ry. & Electric Company (com.) | 89½ | 87½ |
| Washington Ry. & Electric Company (pref.) | 87 | 87 |
| West End Street Railway, Boston (com.) | 70½ | 71 |
| West End Street Railway, Boston (pref.) | 89½ | 92 |
| Westinghouse Elec. & Mfg. Company | 76 | 75 |
| Westinghouse Elec. & Mfg. Co. (1st pref.) | 118 | 119 |

* Last sale. a Asked.

ANNUAL REPORTS

Federal Light & Traction Company

The consolidated statement of income, profit and loss of the Federal Light & Traction Company, New York, N. Y., and its subsidiaries (excluding depreciation) follows:

| | 1913 | 1912 |
|---|-------------|-------------|
| Gross earnings | \$2,329,164 | \$2,167,507 |
| Operating expenses and taxes | 1,389,032 | 1,253,155 |
| Net earnings from operation | \$940,132 | \$914,352 |
| Federal Light & Traction Company | 36,640 | 22,447 |
| Total income | \$903,492 | \$936,799 |
| Interest charges | 531,821 | 442,827 |
| Central Arkansas Railway & Light Corporation dividend | 63,000 | 63,000 |
| Federal Light & Traction Company dividend | 150,000 | 150,000 |
| Discount on bonds | 40,716 | 73,895 |
| Surplus | \$117,955 | \$207,077 |

Intercompany earnings, expenses and interest charges, as well as the operations of the Deming Ice & Electric Company, are not included in the above statement. The central Arkansas Railway & Light Corporation was not incorporated until 1913, but to make the figures for 1912 and 1913 comparable the amount of \$63,000 paid for dividends in 1913 is also deducted from the 1912 earnings in the statement.

The gross earnings for 1913 showed an increase of 7.5 per cent over 1912, but the operating expenses and taxes increased 10.8 per cent during the year, so that the net earnings from operation increased only 2.8 per cent. The increase in operating expenses and taxes was mostly owing to a 42 per cent increase in the taxes during 1913. The total income decreased 3.5 per cent during 1913; interest increased 20.9 per cent; surplus decreased 43.3 per cent.

The report states that the earnings for 1913 were less than anticipated, principally for the following reasons: (1) the conflagration at Hot Springs, Ark., on Sept. 5, 1913, resulting in a loss of the generating station, the discontinuance of service for several weeks and the inauguration of emergency service with increased operating expenses; (2) the decrease in earnings of the Tucson Gas, Electric Light & Power Company under the new rate schedules prescribed by the Arizona Corporation Commission effected Sept. 1, 1913, from which the company feels justified in expecting relief; (3) the extraordinary expenditures in connection with rate cases before the Arizona and Missouri commissions, and (4) the large increase in taxes.

Cleveland, Painesville & Eastern Railroad

The statement of income, profit and loss of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, for the year ended Dec. 31, 1913, as compared with the preceding year, follows:

| | 1913 | 1912 |
|---|-----------|-----------|
| Earnings: | | |
| Passenger revenue | \$312,980 | \$300,413 |
| Special car revenue | 5,079 | 5,657 |
| Mail revenue | 250 | 250 |
| Express revenue | 35,736 | 35,302 |
| Milk revenue | 11,292 | 10,581 |
| Station and car privileges | 1,149 | 1,049 |
| Telephone and telegraph service | 557 | 663 |
| Rent of tracks and terminals | 6,295 | 6,172 |
| Rent of equipment | 11,886 | 11,475 |
| Rent of buildings | 1,725 | 1,468 |
| Power | 17,947 | 10,011 |
| Miscellaneous | 21,027 | 19,144 |
| Total | \$425,923 | \$402,188 |
| Expenses: | | |
| Maintenance of way and structures | \$40,927 | \$37,827 |
| Maintenance of equipment | 20,669 | 21,631 |
| Traffic expenses | 1,771 | 1,294 |
| Conducting transportation | 100,479 | 99,938 |
| General | 45,889 | 44,536 |
| Total | \$209,735 | \$205,226 |
| Net earnings | \$216,188 | \$196,962 |
| Interest and taxes | 152,246 | 138,787 |
| Surplus | \$63,942 | \$58,175 |

The operating ratio of the company was 49.24 per cent in 1913 as compared to 51.02 per cent in 1912, a decrease of 1.78 per cent. The number of car miles decreased from 931,328 to 928,108. The income per car mile was 45.89 cents in 1913, as compared to 43.18 cents in 1912, and the operating expenses per car mile in 1913 were 22.50 cents in 1913 as compared with 22.03 in 1912, leaving net earn-

ings per car mile of 23.39 cents in 1913 as compared with 21.15 cents in 1912. The number of passengers carried increased from 2,609,117 in 1912 to 2,736,106 in 1913, but the earnings per passenger dropped from 11.51 cents in 1912 to 11.43 cents in 1913.

E. W. Moore, president of the company, says in part: "Lighting lines were constructed in Richmond and extensions were made to existing lines. During the year a new Worthington feed water pump was installed in the Painesville power plant and a new 300-kw rotary converter with transformers was installed at Willoughby.

"Two open cars, formerly used for summer traffic, were entirely rebuilt, placed on heavy Baldwin trucks, with Westinghouse 75-hp motors and two other cars were enlarged and remodeled. During the year twenty-two cars were overhauled and repainted.

"During the year property was purchased for \$12,000 in Painesville, on which a modern building will be erected at some future time for a waiting room, ticket office, store-room and an electric package office."

Chicago City Railway

The statement of income, profit and loss of the Chicago (Ill.) City Railway for the year ended Jan. 31, 1914, follows:

| | |
|--|--------------|
| Passenger receipts (Southern Street Railway included) | \$11,289,037 |
| Receipts from other sources | 446,406 |
| Gross earnings | \$11,735,443 |
| Operating expenses, taxes and renewals of combined systems; interest on capital investment of Chicago City Railway and net earnings of Southern Street Railway | 9,931,721 |
| Net earnings | \$1,803,722 |
| City's proportion (55 per cent as per ordinance) | 992,047 |
| Company's proportion (45 per cent as per ordinance) | \$811,675 |
| Interest on capital | 2,305,150 |
| Income from operation | \$3,116,825 |
| Other income, net | 220,799 |
| Total income | \$3,337,624 |
| Interest on bonds outstanding | 1,409,548 |
| Net income | \$1,928,076 |
| Regular dividend—10 per cent | 1,800,000 |
| Surplus | \$128,076 |

In order to avoid any confusion on the subject, it may be well to explain that the item of \$2,305,150 for interest on capital, added in the above statement to obtain the income from operation, represents an amount that was included in the operating expenses, thereby reducing the amount of net earnings to be divided between the city and the company. This amount is 5 per cent on the yearly valuation summarized from certificates of rehabilitation expenditures received monthly from the board of supervising engineers. After the deduction from gross earnings through operating expenses, the city allows this figure to be put back in the statement together with other income, in this way showing the total net available for interest and dividends.

During 1913 the gross earnings of the company increased 9.56 per cent over the figures of the previous year, this increase being mostly due to the 9.3 per cent increase in the passenger receipts during the year. The total expenses, however, increased 9.65 per cent, which gave a comparatively less increase of 8.03 per cent in the net earnings. The increase of 10.4 per cent in the interest on capital was more than offset by the decrease of 25.2 per cent in other income, giving an increase of 6.7 per cent in total income for the period. Interest on bonds increased 19.2 per cent, so that the net income increase was reduced to 0.92 per cent. After the declaration of four quarterly dividends of 2½ per cent as in 1912 the surplus for 1913 showed a decrease of 12.3 per cent, as compared with the previous year.

The report states that sufficient reserves having been set aside under the provisions of the 1907 ordinance to provide for the maintenance and renewal of the property, it was decided by the board of directors to distribute from earnings an extra dividend of one-half of 1 per cent upon the capital stock. Hence the balance in the surplus account at the close of the fiscal year was \$40,334.

During the year the company built 14.24 miles of single track. The total mileage of single track now owned is 306.31 miles.

Further Details of American Water Works & Guarantee Company Reorganization

The stockholders of the American Water Works & Guarantee Company, Pittsburgh, Pa., recently received from the protective committee two circulars giving additional details of the reorganization plan as noted in the *ELECTRIC RAILWAY JOURNAL* of March 21, 1914, and stating that H. Hobart Porter of Sanderson & Porter, New York, would accept the presidency of the reorganized company, to be known as the American Water Works & Electric Company.

The first circular contains an interesting discussion of the situation that confronted the protective committee at the time it was appointed. After stating that the company, which was organized in 1891, had for many years conducted a successful business in the ownership and operation of water power plants and also had a controlling interest in the West Penn Traction properties, the value and earning power of which had been demonstrated, the circular continues as follows:

"The company had, however, during a period of some six years prior to the receivership, engaged in irrigation projects in the far West to an extent and in a manner disproportionate to its resources. It was liable as a guarantor upon approximately \$20,000,000 in mortgage bonds of such irrigation companies, all of them maturing serially year by year. It had been anticipated that the heavy requirements for principal and interest upon these obligations and for the operation and development of the irrigation properties would be met by deferred payments by settlers upon the lands. The payments collected, however, fell far short of these requirements and the deficiency had reached large proportions. The company had thus invested in these projects, in addition to the outstanding bonds, upwards of \$10,000,000, represented by the floating debt of the irrigation companies held by the American Water Works & Guarantee Company. In addition thereto, the American Water Works & Guarantee Company had endorsed and rediscounted with third parties large amounts of paper of those companies for the payment of which it was liable. Not only had the American Water Works & Guarantee Company invested in the properties substantially all the cash received from the sale of its entire issue of preferred stock, but it had used in these enterprises funds which could otherwise have been applied to the current needs of its profitable public service properties, with the result that at the time of the receivership each of its subsidiary companies was stripped of working capital and was indebted to banking institutions upon notes which the American Water Works & Guarantee Company had endorsed to the total net amount of approximately \$3,050,000. In addition to these entanglements, the American Water Works & Guarantee Company had pledged as collateral to its guarantee of the California-Idaho irrigation bonds, the major portion in value of its assets."

By the terms of the reorganization plan, the California-Idaho bondholders are to exchange their present bonds for new 5 per cent twenty-year collateral trust bonds of the reorganized company, par for par against present holdings. The holders of the other four irrigation issues, aggregating \$14,097,800 in principal amount, are to be paid \$1,000,000 for the release of their guarantee. The bondholders will receive 51 per cent interest in the equities remaining in these properties after the payment of principal and interest on their bonds, the new company receiving 49 per cent interest therein. Under the reorganization plan there have been no changes in the capitalization of the subsidiary companies. All of the assets will be taken over by the new company, but there will be no guarantee by the new company on any subsidiary issues, all the guarantees of the old company being cancelled and released.

Bank creditors, whose paper to the amount of \$3,050,000 has matured, have agreed to accept for a portion of that paper twenty-year 5 per cent collateral trust bonds of the reorganized company at 87½, the remainder being renewed and extended over a total period of six years.

According to the second circular, the reorganized company expects to raise \$4,500,000 through its present stockholders by subscriptions to new stock and by assessments on stockholders who do not subscribe. All assessments must be paid in full on or before April 27, 1914, and in case of default, present stockholders will forfeit all interest in the

reorganization. Subscriptions to new stock may be paid in full on or before April 27, 1914, or in instalments ending Oct. 27, 1914, and any stockholders failing to subscribe or pay the first instalment of their subscriptions on or before April 27, 1914, will forfeit all interest in the reorganization.

The circular also states that the committee has caused an underwriting syndicate to be formed, which has underwritten the \$4,500,000 to be provided and has agreed to take and pay for all stock not subscribed for by the stockholders. This underwriting, however, has not been carried on by a strictly banking syndicate, but has been participated in generally by banking firms and individuals.

Upon the full consummation of the reorganized plan, it is anticipated that the new company will possess, among others, assets consisting of \$2,000,000 of cash and \$6,233,300 of first mortgage bonds of the California-Idaho Company, which bonds are a prior lien upon 33,000 acres of land in California. The \$2,000,000 of cash is the amount estimated to be left from the working capital subscribed after payment of various amounts for acquiring the properties, and paying creditors and organization and reorganization expenses. Through its ownership of the capital stock of the United Water & Light Company, the reorganized company will own directly or indirectly \$42,011,500 of the outstanding stock of thirty-five electric light, water works and traction companies and one coal company. These companies, together, have \$59,585,000 of capital stock outstanding, \$1,385,000 of which is pledged under the mortgage of the United Water & Light Company.

Included in one of the circulars of the stockholders is a letter from Sanderson & Porter, estimating the earnings of the new company for the first full year's operation and income from securities held. Earnings received and accrued are placed at \$1,500,953 and \$500,000 is allowed for amounts to be left with subsidiary companies and for general expenses of the new company. Interest on the \$6,250,000 of collateral trust bonds of the new company amounting to \$312,500 is then deducted, leaving \$688,453. From this is deducted \$350,000 for the first preferred dividend, leaving a balance of \$338,453 for the participating preferred and common stocks. The details of these proposed stock issues were given in the *ELECTRIC RAILWAY JOURNAL* of March 21.

The presidency of the reorganized company, as noted above, will be filled by H. Hobart Porter, and the following have been chosen as directors: E. C. Converse, A. H. Wiggin, Samuel Insull, Guy E. Tripp, James D. Mortimer, William Nelson Cromwell, H. Hobart Porter, J. B. Finley, W. B. Schiller, Charles R. Scott, H. J. Delaney Meijer, Theodore Revillon, H. C. Huffer, Jr., Andrew V. Stout, Charles H. Payson, Henry Russell Platt and Henry H. Pierce. It will be noticed that the above list does not contain the names of any in the old board of directors of the American Water Works & Guarantee Company. No information is as yet available in regard to the other officers of the new company, or the personnel of the voting trust.

According to a decree entered in the United States Circuit Court in Pittsburgh on March 16, the receivership will be closed by the sale of the assets of the company on April 15, 1914. The upset price is \$1,000,000. The property will then be purchased in accordance with the reorganization plan.

Tramways and Light Railways in Chosen, Corea.

According to the annual report of the Railway Bureau of the Government-General of Chosen, Corea, for the year ending March 31, 1912, the tramways and light railways in Chosen in operation at the end of the year were three, the Nikkan Gas-Electric Company and two others. During the year sanction was given for the construction of 14.2 miles of track and applications were rejected for manual tramways aggregating 27 miles in length. The mileage open to traffic at the end of the year totaled 20.9 miles, consisting of 13.4 miles of electric tramways, 6.2 miles of light railways and 1.3 miles of manual tramways. The aggregate capital of these companies totaled yen 6,572,408, while the amount invested in tramway and light companies amounted to yen 1,675,557. Passengers during the year numbered 6,644,804 and passenger mileage reached 627,020. The receipts were yen 258,353 and the expenditures yen 156,937, leaving a balance of yen 101,416.

Central Park, North & East River Railroad, New York, N. Y.—George W. Lynch, receiver of the Central Park, North & East River Railroad, and several directors of the company have been made defendants in a bill of equity filed in the United States District Court in Philadelphia by F. B. Kelly, owner of twelve shares of stock in the company, who charges that more than \$2,000,000 of the assets were wasted through mismanagement of the directors. He asks for a decree ordering them to pay the company the value of the property alleged to have been wasted. A similar action brought in New York by F. C. Titus, Jr., is still pending.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis.—A quarterly dividend of 1¼ per cent has been declared on the \$1,000,000 of common stock of the Chippewa Valley Railway, Light & Power Company, payable on April 1, 1914, to holders of record of March 30, 1914. This compares with 2 per cent paid in January, 1914, and in each quarter in 1913.

Cincinnati (Ohio) Traction Company.—The Tillotson & Wolcott Company, Cleveland and Cincinnati, is placing at par and interest \$80,000 of equipment trust 5 per cent gold certificates, series E, of the Cincinnati Traction Company. These are part of an issue of \$200,000 dated March 1, 1914, the authorization of which was noted in the *ELECTRIC RAILWAY JOURNAL* of March 7, 1914.

Columbus, Marion & Bucyrus Railway, Marion, Ohio.—The Columbus, Marion & Bucyrus Railway was reorganized on March 25, 1914, when the following officers were elected: President, George Whysall, who had been the agent of the bondholders' committee in operating the road since it was purchased in May last year; vice-president and treasurer, Charles Gallinger; secretary, Ray C. Oswald. The directors are F. L. Hopley, William H. Auck and Charles Gallinger, Bucyrus, Ohio, and Ray C. Oswald and George Whysall, Marion, Ohio. Mr. Whysall will continue as general manager. On the following day two deeds of trust, one for \$100,000 to the Guardian Savings & Trust Company, Cincinnati, Ohio, and the other for \$250,000 to the Columbia-Knickerbocker Trust Company, New York, N. Y., were prepared for filing in both Marion and Crawford County. The bonds of \$100,000 to be issued under the first mortgage will bear 6 per cent interest and the proceeds are to be used to pay the expenses of the transfer and for contemplated improvements. The second mortgage bonds of \$250,000 will bear interest at the rate of 3 per cent the first year, 4 per cent the second year and 5 per cent thereafter.

Consolidated Cities Light, Power & Traction Company, New York, N. Y.—A quarterly dividend at three-fourths of 1 per cent was declared on the capital stock of the Consolidated Cities Light, Power & Traction Company, payable on April 1, 1914, to holders of record March 15, 1914. This compares with one-half of 1 per cent paid in January, 1914 and in October, 1913, when the initial disbursement was made.

Dallas (Tex.) Electric Corporation.—Stone & Webster offer a limited amount of Dallas Electric Corporation first mortgage collateral trust 5's, at 97½ and interest to yield about 5.40 per cent. Through the deposit of collateral the bonds are secured by first lien on the properties of local companies which do an electric railway, electric lighting and power business in Dallas. The mortgage under which the above bonds are issued is closed, and the sinking fund, which amounts to 1 per cent per annum, has thus far retired \$458,000 of the bonds.

Eastern Pennsylvania Railways, Pottsville, Pa.—The Eastern Pennsylvania Railways reports for the twelve months ending Feb. 28, 1914, as follows: Gross earnings, \$822,088, being an increase of \$97,597; operating expenses, \$476,683.22, an increase of \$58,172; net earnings, less taxes, \$328,371, an increase of \$34,954. After deduction of interest on underlying bonds and rentals \$282,944 was available for major bond interest, an increase of \$54,555.

Eastern Power & Light Corporation, New York, N. Y.—The Eastern Power & Light Corporation, which controls the Reading Transit & Light Company, has secured control of the Lebanon Valley Electric Light Company, Lebanon, Pa., through the purchase of the holdings of the Weaver interests, which are said to have received \$41,500 in cash

and \$75,000,000 of the common stock of the Eastern Power & Light Corporation for their stock interest in the Lebanon Valley Electric Company.

El Paso (Tex.) Electric Company.—Stockholders of the El Paso Electric Company voted at a meeting held on March 9, 1914, to increase the common stock of the company by \$1,000,000, making the present authorized capital stock \$1,000,000 of preferred stock and \$3,000,000 of common stock. It is expected that \$375,000 of the new common stock will be offered pro rata to preferred and common stockholders of record March 16, 1914, as noted in the *ELECTRIC RAILWAY JOURNAL* of February 28, 1914.

Fort Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind.—Charles D. Barney & Company, Philadelphia, Pa., are offering at 82½ and interest, to yield 6.6 per cent, first consolidated mortgage 5 per cent bonds of the Fort Wayne & Wabash Valley Traction Company, due on March 1, 1934. These bonds are an underlying issue of the Fort Wayne & Northern Indiana Traction Company and are a closed mortgage issue with \$6,966,000 outstanding. The bonds of the Fort Wayne & Northern Indiana Traction Company are reserved to retire the divisional bonds at maturity.

Grand Valley Railway, Brantford, Ont.—The purchase of the Brantford Street Railway and the Grand Valley Railway by the city of Brantford was endorsed by the rate-payers' vote on March 23, 1914. The proposal of such a purchase was noted in the *ELECTRIC RAILWAY JOURNAL* of Feb. 21, 1914.

Interborough Rapid Transit Company, New York, N. Y.—The banking syndicate composed of Lee, Higginson & Company, Boston, Mass., and N. W. Harris & Company and Kissell, Kinnicutt & Company, New York, N. Y., which recently purchased a second lot of \$10,000,000 of Interborough Rapid Transit Company 5 per cent first mortgage bonds, announces the disposal of these bonds and the exercise of an option on an additional \$1,000,000 of bonds. It is reported that these bankers have within six months marketed \$41,000,000 of these bonds.

Ithaca (N. Y.) Traction Corporation.—The Ithaca Traction Corporation, which succeeded the Ithaca Street Railway on April 1, 1914, has elected officers as follows: R. B. Williams, Jr., president; H. W. Fitz, first vice-president; Charles E. Hotchkiss, second vice-president; H. A. Clarke, third vice-president and secretary; T. P. Clancy, treasurer. An account of the hearing before the Public Service Commission of the Second District of New York in regard to the proposed reorganization plan of the Ithaca Street Railway, which was sold under foreclosure recently, was published in the *ELECTRIC RAILWAY JOURNAL* of March 7, 1914, page 557.

Joliet, Plainfield & Aurora Railroad, Joliet, Ill.—The minority bondholders of the Joliet, Plainfield & Aurora Railroad have organized to protest against the recent sale of the road to the majority bondholders for \$250,000, as noted in the *ELECTRIC RAILWAY JOURNAL* of February 21, 1914. They estimate the minimum value of the road at \$500,000.

Lake Shore Electric Railway, Cleveland, Ohio.—The Lake Shore Electric Railway has notified the State Public Utilities Commission that it has been unable to sell \$70,000 of bonds recently authorized by the commission at 85, and permission has been asked to use the bonds as security for a loan of \$42,000.

Monongahela Valley Traction Company, Fairmont, W. Va.—According to an official announcement, the 5 per cent general mortgage bonds of the Monongahela Valley Traction Company have been made tax exempt in the State of Pennsylvania.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Traction & Light Company and the Canton-Akron Consolidated Railway, which is controlled by the former company, have united in a joint request for permission to issue \$58,000 of general consolidated bonds.

Nova Scotia Tramway & Power Company, Ltd., Halifax, N. S.—A bill was introduced in the Nova Scotia Legislature on March 24, 1914, to incorporate the Nova Scotia Tramway & Power Company, Ltd. The names of the directors are largely the same as those on the Halifax Tramways.

The capital is to be \$5,000,000. The bill authorizes the purchase of the Halifax Tramways, which is empowered to sell the present outstanding stock at \$170 a share. The Nova Scotia Light & Power Company agrees to transfer to the company all its rights and lands at Gaspereaux and at Sheet Harbour. The Halifax Electric Tramways operates 13.15 miles of line and fifty motor cars. Its authorized capital stock is \$1,500,000. Of this amount \$1,400,000 is outstanding. The company also has issued and outstanding \$600,000 of gold bonds which are due on Jan. 1, 1916.

Ocean Shore Railway, San Francisco, Cal.—The Railroad Commission of California recently heard an application by the reorganized Ocean Shore Railway to issue \$200,000 of bonds for the purpose of electrifying its line between San Francisco and Half Moon Bay, and an alternative proposition to issue \$60,000 of bonds for the purchase of three gasoline cars, if it was found impracticable to market the larger bond issue at the present time. F. W. Brady, president of the company, testified that holders of real estate along the Ocean Shore Railway had demanded better train service and had agreed to subscribe for \$60,000 of bonds if the commission would approve the issue. Some opposition was made on the ground that the title of the new company is still in doubt, pending a decision by the State Supreme Court, and that there is a possibility that the bonds might be invalidated if the decision should be in favor of the stockholders and bondholders of the defunct Ocean Shore Railroad.

Portland Railway, Light & Power Company, Portland, Ore.—The Portland Railway, Light & Power Company has obtained control of the Willamette Valley Southern Railway, which is building a standard gage electric line on private right-of-way 32 miles in length, from Oregon City to Molalla and Mt. Angel, Ore. The new line connects at Oregon City with the Portland Railway, Light & Power Company's interurban service to Portland and when completed will give through connection from Portland to Mt. Angel, a distance of approximately 47 miles. Seven miles of track has already been laid and more than two-thirds of the grading has been finished. The line will be operated by electricity at 1200 volts and the track will be almost entirely of 70-lb. rail with rock ballast. The road is being constructed and will be operated under the direct supervision of the Portland Railway, Light & Power Company.

Underground Electric Railways, Ltd., London, England.—According to the sixteenth annual report of the directors of the Underground Electric Railways, Ltd., London, England, for the year ended Dec. 31, 1913, the gross revenue of the company for 1913 was £629,817, as compared with the gross income at the rate of £558,438 per year for the second half of 1912. There was a surplus of £45,170 after meeting the full 6 per cent interest (with income tax) on the income bonds of 1948, as compared with £2,996 brought forward from 1912. The net revenue of the company from investments in properties (including general interest), after deducting general expenses and including the balance brought forward, amounted to £623,838. The deduction of £84,489 for the service of the 4½ per cent bonds of 1933 left a surplus of £539,349. This amount, according to the report, will be applied as follows: £26,839 for payment under the guarantee on Central London Railway assented stocks for 1913; £76,380 for interest at the rate of 6 per cent per annum on the £1,273,000 of 6 per cent first cumulative income debenture stock, and £390,969 for interest at the rate of 6 per cent per annum, plus income tax on £6,136,050 of 6 per cent bonds of 1948, leaving a balance of £45,170, as noted above.

West Penn Traction Company, Pittsburgh, Pa.—G. B. Caldwell, vice-president of the Continental & Commercial Trust & Savings Bank, Chicago, Ill., and H. R. Platt, a Chicago attorney, have organized an underwriting syndicate for the purchase of \$6,000,000 of three-year 6 per cent collateral trust notes of the West Penn Traction Company. This syndicate is composed of prominent bankers and bond houses in New York, Chicago and Pittsburgh, and is managed by the Continental & Commercial Trust & Savings Bank, Chicago, Ill., and A. B. Leach & Company, New York, N. Y. The proceeds of the note issue are to be used to retire all the existing indebtedness of the company and

provide money for improvements and extensions during 1914.

Dividends Declared

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¼ per cent, common.
Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly 1½ per cent, preferred; quarterly, 1½ per cent, common.
City Railway, Dayton, Ohio, quarterly, 1½ per cent, preferred; quarterly, 2 per cent, common.
Consolidated Cities Light, Power & Traction Company, New York, N. Y., quarterly, ¾ of 1 per cent.
Easton (Pa.) Consolidated Electric Company, 2 per cent.
Louisville & Northern Railway & Lighting Company, New Albany, Ind., quarterly, 3 per cent, preferred.
Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.
Memphis (Tenn.) Street Railway, quarterly, 1¼ per cent, preferred.
Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred.
Springfield & Xenia Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.
Western Ohio Railway, Lima, Ohio, quarterly, 1¼ per cent, first preferred; quarterly, 1½ per cent, second preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

| CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO | | | | | | |
|--|----------------|--------------------|--------------|---------------|-------------|--|
| Period | Gross Earnings | Operating Expenses | Net Earnings | Fixed Charges | Net Surplus | |
| 1m., Feb., '14 | \$82,929 | \$55,426 | \$27,504 | \$31,588 | \$4,084 | |
| 1 " " '13 | 81,277 | 52,728 | 28,550 | 30,705 | 2,155 | |
| 2 " " '14 | 176,981 | 115,567 | 61,415 | 63,483 | 2,069 | |
| 2 " " '13 | 172,820 | 112,007 | 60,813 | 61,647 | 784 | |
| COLUMBUS (GA.) ELECTRIC COMPANY | | | | | | |
| 1m., Jan., '14 | \$55,986 | *\$24,205 | \$31,781 | \$25,282 | \$6,499 | |
| 1 " " '13 | 57,598 | *27,514 | 30,084 | 19,919 | 10,165 | |
| 12 " " '14 | 642,873 | *291,343 | 351,530 | 278,042 | 73,488 | |
| 12 " " '13 | 620,849 | *272,064 | 348,785 | 228,274 | 120,511 | |
| DALLAS (TEX.) ELECTRIC COMPANY | | | | | | |
| 1m., Jan., '14 | \$201,071 | *\$128,399 | \$72,672 | \$26,778 | \$45,894 | |
| 1 " " '13 | 170,815 | *106,094 | 64,721 | 24,635 | 40,086 | |
| 12 " " '14 | 2,223,756 | *1,302,363 | 921,393 | 305,113 | 616,280 | |
| 12 " " '13 | 1,857,207 | *1,112,647 | 744,560 | 295,278 | 449,282 | |
| EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX. | | | | | | |
| 1m., Jan., '14 | \$55,014 | \$36,589 | \$18,425 | \$8,244 | \$10,181 | |
| 12 " " '14 | 504,183 | 291,814 | 212,369 | 74,859 | 137,510 | |
| EL PASO (TEX.) ELECTRIC COMPANY | | | | | | |
| 1m., Jan., '14 | \$92,713 | *\$49,548 | \$43,166 | \$4,284 | \$38,882 | |
| 1 " " '13 | 80,922 | *41,843 | 39,079 | 1,971 | 37,108 | |
| 12 " " '14 | 907,906 | *486,064 | 421,842 | 50,328 | 371,514 | |
| 12 " " '13 | 804,466 | *436,441 | 368,025 | 64,477 | 303,548 | |
| GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX. | | | | | | |
| 1m., Jan., '14 | \$197,277 | *\$120,147 | \$77,130 | \$36,485 | \$40,645 | |
| 1 " " '13 | 169,615 | *105,124 | 64,491 | 33,660 | 30,831 | |
| 12 " " '14 | 2,400,727 | *1,367,396 | 1,033,331 | 424,037 | 609,294 | |
| 12 " " '13 | 2,051,265 | *1,197,070 | 854,195 | 405,197 | 448,998 | |
| HOUGHTON (MICH.) COUNTY TRACTION COMPANY | | | | | | |
| 1m., Jan., '14 | \$22,137 | *\$15,198 | \$6,939 | \$5,610 | \$1,330 | |
| 1 " " '13 | 24,379 | *15,776 | 8,603 | 5,752 | 2,851 | |
| 12 " " '14 | 294,611 | *179,682 | 114,929 | 67,450 | 47,479 | |
| 12 " " '13 | 309,760 | *172,166 | 137,593 | 67,758 | 69,835 | |
| JACKSONVILLE (FLA.) TRACTION COMPANY | | | | | | |
| 1m., Jan., '14 | \$62,546 | *\$38,152 | \$24,394 | \$12,868 | \$11,526 | |
| 1 " " '13 | 49,823 | *33,567 | 16,256 | 11,039 | 5,217 | |
| 12 " " '14 | 692,344 | *443,174 | 249,170 | 145,546 | 103,624 | |
| 12 " " '13 | 562,483 | *380,131 | 182,352 | 120,751 | 61,601 | |
| NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO | | | | | | |
| 1m., Feb., '14 | \$248,006 | \$154,878 | \$93,128 | \$50,031 | \$43,097 | |
| 1 " " '13 | 222,570 | 138,129 | 84,441 | 45,197 | 39,244 | |
| 2 " " '14 | 518,967 | 326,170 | 192,797 | 99,493 | 93,304 | |
| 2 " " '13 | 460,036 | 280,379 | 179,657 | 89,868 | 89,789 | |
| PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH. | | | | | | |
| 1m., Jan., '14 | \$754,035 | *\$434,634 | \$319,400 | \$173,899 | \$145,501 | |
| 1 " " '13 | 701,640 | *437,914 | 263,726 | 165,797 | 97,929 | |
| 12 " " '14 | 8,665,995 | *5,005,097 | 3,660,899 | 2,071,120 | 1,589,779 | |
| 12 " " '13 | 8,294,702 | *4,797,859 | 3,496,843 | 1,986,582 | 1,510,261 | |
| REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y. | | | | | | |
| 1m., Feb., '14 | \$234,971 | *\$139,485 | \$95,486 | \$44,762 | \$50,724 | |
| 1 " " '13 | 228,413 | *138,327 | 90,087 | 45,875 | 44,212 | |
| 2 " " '14 | 492,949 | *291,764 | 201,186 | 87,851 | 113,335 | |
| 2 " " '13 | 472,754 | *286,893 | 185,861 | 91,692 | 94,169 | |

*Includes taxes.
†Deficit.

Traffic and Transportation

Chicago Considering Interurban Market Service

The Chicago City Council recently authorized the Mayor to appoint a commission to investigate market conditions in Chicago and the representatives of the interurban roads entering the city were invited to advise the commission of the possibility of shipping foodstuffs by the interurban lines. E. J. Bock, general superintendent of the Chicago & Milwaukee Electric Railroad; Richard Breckenridge, general freight and passenger agent of the Aurora, Elgin & Chicago Railroad; J. R. Blackhall, general manager of the Chicago & Joliet Electric Railway, and F. E. Fisher, general superintendent of the Chicago, Ottawa & Peoria Interurban Railway, appeared before the commission. Each representative outlined to the members of the commission the possibilities of taking advantage of electric railways to improve Chicago's market conditions. Mr. Breckenridge said:

"Unlike other municipalities Chicago has never shown a disposition to utilize the electric lines to their full extent. It is true that the Aurora, Elgin & Chicago Railroad and to some extent the Chicago, Lake Shore & South Bend Railways carry passengers into the downtown district, but only the Chicago & Interurban Traction has the right to bring milk, produce or any freight into the city. The Aurora, Elgin & Chicago Railroad brings three carloads of milk daily to the western limits of Chicago and could bring as many more were it enabled, as are its steam railroad competitors, to deliver these shipments into the city as far as Canal Street. It is, of course, impossible to say what a freight rate will be to a point not yet decided and under unknown conditions. I think I am safe in saying that if the electric road is allowed direct access to your market, the rate will be less for fast service than the cost of the present inferior service, particularly considering the teaming cost and freight-house delays that will then be eliminated. The electric roads operate more intensively. They will run more trains than the steam roads and make stops convenient for the growers. The steam roads now have more business in Chicago than they can handle with dispatch. Being ambitious for traffic, the electric road will foster and promote this business to the benefit to the consumers of Chicago."

The commission is compiling data and expects to report to the City Council in the near future.

Brooklyn Rapid Transit Tax Burden

In the series of advertisements which it is publishing in the Brooklyn newspapers, dealing with various phases of its activities, the Brooklyn (N. Y.) Rapid Transit Company recently included the following statement headed "Why We Need the Nickels," setting forth plainly the tax burden which the company is called upon to meet:

"About fourteen years ago we published some figures showing that our taxes averaged \$2,900 per day. These figures caused much comment, not only in this community but throughout the country. The weight of the burden was a revelation.

"But by comparison with last year's figures we lived then in good old easy times.

"In 1913 we actually paid in taxes to city, state and nation \$1,770,217.

"This was at the rate of \$4,850 per day!

"Our average receipt per passenger was 3.74 cents. The expense of transporting (not including taxes) was 2.91 cents, leaving the net return per passenger 0.83 of 1 cent.

"Therefore, we had to carry 584,000 passengers each day to yield profit enough to pay our tax bills!

"One dollar out of every \$3.57 earned went to city, state or nation—equal to a net income tax of 28 per cent.

"There were ten different kinds of taxes, to wit: special franchise, tracks, etc., outside of special franchise, parcels of real estate, local capital stock, state capital stock, city tax on earnings, state tax on earnings, federal income, car license fees, bridge tolls.

"These were divided as follows: to city, \$1,368,328; to state, \$320,416; to nation, \$81,473; total, \$1,770,217.

"The amount paid to the city alone was more than suffi-

cient to pay all the cost for 1914 of the following departments of city government as authorized in the budget: board of estimate, commissioners of sinking fund, Mayor's office, city chamberlain's office, Municipal Civil Service Commission, commissioners of accounts, bureau of weights and measures, bureau of licenses, commissioner of licenses, board of assessors, art commission, examining board of plumbers.

"The amount paid to the city alone was more than the entire expense of maintaining the parks of Brooklyn and Bronx and their administration. It was more than the entire cost of maintaining the public libraries of Manhattan, Brooklyn and Queens. It was equal to 60 per cent of this year's budget for all those manifold municipal activities under the jurisdiction of the Borough President of Brooklyn.

"The average tax paid to the city per capita in Brooklyn for 1913 was about \$17.

"Our tax bill to the city, therefore, was the equivalent of the tax bills of nearly 78,000 persons!

"These are astounding figures. They indicate not only the extent of our financial contribution to the city's support, but the handicap and burden upon us in attempting to give additional transit facilities. They are food for reflection for those who criticize car service.

"Our annual tax bill, capitalized at 5 per cent, would permit an expenditure of \$35,400,000 for added improvements and extensions.

"It would build 35 miles of new subway tracks.

"And yet when we, and suffering citizens, apply to the city, as we must, for the privilege of furnishing new facilities—even though some of these offer no present prospect of additional profits, as for instance franchises on Metropolitan Avenue, Atlantic Avenue and Eighth Avenue—some short-sighted public officials insist that these should not be permitted except upon still more burdensome conditions that make acceptance impossible.

"The further you go into this story of the nickels, how irresistible is the conviction that from every point of view Our Interests are Your Interests."

Hearing on Fares Between Worcester and Jefferson

Hearings were concluded by the Massachusetts Public Service Commission on March 19, 1914, upon the petition of a committee for the town of Holden for a reduction of fares from 15 cents to 10 cents between Jefferson and Worcester, on the Worcester Consolidated Street Railway. The petitioners were represented by Webster Thayer, and the company's case was conducted by Francis H. Dewey, president of the company. The burden of the petitioners' case was that the existence of a third 5-cent-fare zone between the center of Holden and Jefferson, a distance of about 1.6 miles, was inequitable.

Mr. Dewey stated that the Worcester Consolidated Street Railway purchased the Worcester & Holden line for \$150,000, and he contended that the company cannot afford to carry passengers from Worcester to the end of the line in Jefferson for less than 15 cents. The distance is 9.66 miles. The present fare includes a free transfer to or from all parts of Worcester, which increases the maximum ride to about 14 miles for 15 cents. Traffic counts show that if the 10-cent fare is established the reduction in income on the line will be at the rate of \$11,000 per year. Careful studies by the company's auditor show that the yearly present income of the line from the city hall, Worcester, to Jefferson is \$56,451, and that the net earnings are about \$7,500, or 5 per cent on the cost of the Worcester-Holden branch of the Consolidated system. Last year the company paid 5½ per cent on all its outstanding stock. If the fare reduction is effected, the line will face a deficit of \$3,500 which must be made up by the rest of the system. Northborough, Sterling and other towns separated by a second municipality from Worcester as a rule pay 15 cents in three fare collections between these communities and the city hall in Worcester.

In response to a request by the petitioners' counsel for a physical valuation of the Worcester-Holden line, Mr. McLeod, chairman of the commission, set forth his view upon the treatment of such problems in small town cases in part as follows:

"It is practically impossible for a commission of this kind

to make a physical valuation in any matter involving some rearrangement of fares upon a street railway system unless the claim is positively made that any change in the nature suggested by the petitioners would be confiscatory. It is impractical, in handling a large number of such cases, to make a valuation. This matter must be considered as affecting the Worcester Consolidated system as a whole. When this line was consolidated with the Worcester company there was no longer any legal obligation that the line should pay its proper return upon the value of the property, provided that the general arrangement of fares over the system is just and provided there is no undue encroachment upon the revenues of the company as a whole. The question whether or not the particular branch line is earning a fair return is not conclusive, because there may be considerations in the case which make it desirable in the interest of the general public, especially if it can be shown that the service and fares rendered at the present time are not reasonable, that some of the burden in carrying the line should be thrown upon the system as a whole. Another phase is whether these fare limits bear any just relationship to the fare limits on other similar lines serving in the main a similar territory, in view of the effect of the decision as a precedent."

The case was taken under advisement.

Prepayment Cars in Winnipeg.—Commissioner Robson of the Manitoba Public Utility Commission will order that all cars to be built in future for the Winnipeg Electric Railway shall be of the pay-as-you-enter type. The company proposes to arrange in future to have its cars stop on the near side of the street.

Record Run on Oakland, Antioch & Eastern Railway.—A three-car train of the Oakland, Antioch & Eastern Railway, Oakland, Cal., established a record for passenger trains between Sacramento, Oakland and San Francisco on March 22, 1914, by making the run to Oakland in two hours and eighteen minutes and to San Francisco in two hours and fifty-five minutes.

Plan to Establish "Suburban Day."—The interurban electric railroads running into Kansas City, Mo., probably will co-operate with the Merchants' Association in establishing "Suburban Day." One day of each week will be set aside for out-of-town shoppers and special inducements will be offered on that occasion. A day on which traffic is normally light will be selected, according to present plans.

Illinois Fare Case Under Advisement.—The Illinois Public Utility Commission has taken under advisement the protest lodged by patrons of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., against the company in connection with its proposal to substitute a sixty-ride ticket book for the present fifty-four ride ticket book. It is claimed by the petitioners that the change will involve an advance of 10 per cent in rates.

Employees' Bulletins in Brooklyn.—The Brooklyn (N. Y.) Rapid Transit Company has begun the publication of an employees' bulletin. The paper is in the shape of a folder with eight pages and is 3½ in. wide by 6 in. high. Like the similar publication of the United Railways & Electric Company, Baltimore, Md., the Brooklyn bulletin deals with some subject of specific interest to the employees. The issue of March 18, 1914, contained an appeal to the men. The appeal is headed "Concerning Profanity," and is signed by William Seibert, superintendent of the surface lines.

The Topeka Advertising Campaign.—The Topeka (Kan.) Railway has emphasized a fundamental principle of merchandising in its recent advertisements exploiting its service and the large return the people secure for a 5-cent fare. "The maximum of demand insures the minimum of cost," ran a recent ad. "If only a few people used the street car it would necessarily increase the cost of transportation." The advertisement pointed out that where street railway service is generally used the price is low and that only by such use can service be improved.

Extension of Boston Transfers Approved.—The Massachusetts Public Service Commission has approved a rearrangement of free transfer privileges by the Boston Elevated Railway at the Scollay Square station of the Tremont Street subway between Cambridge bridge cars and subway

cars, so that passengers boarding inbound Cambridge bridge cars and paying fares east of Kendall Square may transfer to north and south-bound cars in the subway at Scollay Square, and that checks may be issued from Scollay Square to cover travel in the reverse direction.

Change in Terms of Mileage Ticket.—The Albany Southern Railroad, Hudson, N. Y., with the approval of the Public Service Commission of the Second District of New York, has changed the rules and regulations governing the sale and use of 500-mile ticket books. The limit as to time for use has been made one year from date of sale and the minimum coupon detachment for any ride has been changed from four to three. A table showing the distances between all stations and stops provided to govern coupon detachments has been filed with the commission.

Illinois Utilities Commission Permits Free Rides.—The State Public Utilities Commission of Illinois has made a ruling in favor of free transportation being extended by carriers to policemen, firemen and letter carriers. On Jan. 17, 1914, the commission decided that for the present the new body would follow the ruling of the Interstate Commerce Commission and would permit free rides to employees of public utilities and to policemen, firemen and letter carriers only when such privilege was provided for in contractual ordinances previous to the establishment of the new commission.

Fare Question in Oakland.—The Chamber of Commerce of Oakland, Cal., and seven improvement associations of East Oakland have asked the Railroad Commission of California to compel the Southern Pacific Company to collect only 5 cents for a continuous ride in one direction in Oakland. The company is charging a 10-cent fare between such points as Oakland pier and Melrose Heights, and has asked the commission to authorize this fare on the ground that it is just and barely compensatory. The commission has set May 9, 1914, as the date for a formal hearing on the railroad company's application.

Organization of Improvement League Completed.—The organization of the New London County Improvement League was completed at a meeting on March 16, 1914, at which the complete list of directors from the towns was made up and the officers of the league were elected. The attendance at the meeting was fifty. This is the organization with which the Shore Line Electric Railway, Norwich, Conn., proposes to co-operate with the end in view of furthering agricultural development along its lines. The plans of the company in this connection were referred to at length in the *ELECTRIC RAILWAY JOURNAL* of March 7, 1914, page 561.

Heavy Freight Traffic at Louisville.—R. H. Wyatt, general freight and passenger agent of the Louisville & Interurban Railway, Louisville, Ky., stated recently that the company's freight business for the first three months of 1914 was the heaviest in its history. Mr. Wyatt attributes a good deal of the activity in freight movements on the company's interurban lines around Louisville to shipments of feed, the requirements of the farmers being unusually heavy in this line, on account of the poor growing season last year. Other goods are also carried in large quantities, however, indicating a growing appreciation on the part of the country merchants of the advantages of the company's rapid and frequent service.

Re-routing Cars in Columbus.—Plans for re-routing cars on a number of lines are being prepared by the Columbus Railway, Power & Light Company, Columbus, Ohio. The West Broad Street cars are to be run from Broad Street north on Front Street to Long Street and thence over the Mt. Vernon Avenue route. The cemeteries and the Leonard Avenue lines are to be united and the Pennsylvania Avenue cars are to be operated south on Fourth Street to Livingston Avenue, where the route will terminate. The Oak Street line on North High Street will be replaced by a short line circling into Fourth Street by way of Main and Chestnut Streets. These changes are contemplated in order to relieve the growing congestion on High Street. They will involve an expenditure of \$50,000 to \$60,000 on West Long Street.

Mail Service Discontinued on Account of Inadequate Compensation.—The West Chester (Pa.) Street Railway restored

the early mail service between West Chester, Kennett Square, Downingtown and Coatesville on March 19, 1914. The extended period of service was agreed to by Jonas L. Rice, manager of the company, in conference with Norris B. Slack, county chairman of the Democratic committee. When the contract between the United States postoffice department and the West Chester Street Railway expired on March 16, 1914, the latter refused to renew on account of the greatly increased amount of mail carried and the small compensation allowed by the government for the service. It is hoped that at the expiration of the month's grace the government will arrange to compensate the company on a basis commensurate with the volume of business carried.

Fare Cases Before Oregon Commission.—With the completion of introduction of evidence in the Linnton rate case of the United Railways, Portland, Ore., on March 20, 1914, the hearing was postponed until April 20, 1914, by Clyde B. Aitchison of the Railroad Commission of Oregon so that the defense may go over the evidence. In the Linnton case the United Railways asks permission to increase fares to Linnton. Another electric railway fare case, the application of the Tualatin Valley Transportation Association for a reduction of rates on the Oregon Electric Railway between Portland and places in Tualatin Valley, is before the commission and hearings are now being held. The association set forth that the fare of 5 cents to Capitol Hill, 3 miles; 20 cents to Garden Home, 6.9 miles, and 40 cents to Tualatin, 14.4 miles, is excessive and discriminatory. The association contends that the Portland Railway, Light & Power Company carries passengers much farther than 7 miles for 5 cents and that the United Railways has a 5-cent fare to Linnton, 8½ miles from Portland.

Limited Stop Cars for Cambridge, Mass.—The Boston (Mass.) Elevated Railway is gradually extending its limited-stop surface car service during rush hours in various suburban districts. The latest line to be taken up in this connection is the Newton-North Cambridge route, between North Cambridge, Harvard Square and Mt. Auburn bridge, the plan being to run cars express from these limiting points to Harvard Square in the morning rush and express from Harvard Square outward in the afternoon rush. To care for local travel cars will stop to pick up passengers when outward bound and to discharge passengers when going inward. New "limited-stops" signs, 21 in. by 19 in. in dimensions, and painted red and white, are to be used at each end of the car. The word "stops" is carried in the center of a red disc 13 in. in diameter, to enable these cars to be identified from the sidewalks and thus to avoid possible injury by automobiles to patrons who might occupy the streets in endeavoring to classify cars as local or express service units. The display of the signs is under control of street inspectors and station masters.

Suggestions from Employees Regarding Transportation Improvements.—Every attache of the general offices of the Metropolitan Street Railway, Kansas City, Mo., has been urged to keep his or her eyes open for ideas which will tend to make for greater efficiency, not only in his or her own department, but more especially in the transportation department, which is in constant touch with the public. To give general office employees more scope a set of tickets has been issued to each member of the staff intended to show the time spent by employees of the offices in going to work on the cars in the morning and returning home at night, as well as during the lunch hour, provided any make the round trip at that time. The company receives many unsolicited suggestions daily from the public, but the majority of these are unsuitable for adoption as they come from persons without experience in street railway work. By securing reports from its own employees, the company hopes to receive practical suggestions, as the office staff appreciates what can and cannot be put into execution. The tickets will be turned in to the heads of the various departments for transmission to the executive officers, who will be the judges as to the advisability of adopting such plans as may be proposed. The blanks call for reports from the employees in regard to the line on which they travel, the car number, the direction, the places at which they board cars, the places at which they leave cars, the number of passengers, the block number, the time off, the time on and such remarks and suggestions as they may care to make.

Personal Mention

Mr. Frank J. Duffy, manager of the Southern Railway & Light Company, Natchez, Miss., has been elected president of the company.

Mr. George Theis, Jr., president of the Arkansas Valley Interurban Railway, Wichita, Kan., has, in addition, been appointed general manager of the company to succeed Mr. O. A. Boyle, who continues as a director.

Mr. W. H. Trask, formerly commercial agent of the Idaho Railway, Light & Power Company, Boise, Idaho, has become connected with the commercial department of the Utah Power & Light Company, Salt Lake City, Utah.

Mr. William Temple Emmett was nominated by Governor Glynn for appointment to the Public Service Commission of the Second District of New York just before the close of the legislative session of March 28, 1914, and the appointment was confirmed by the Senate.

Mr. George Whysall, who has been acting as agent of the bondholders committee in charge of the operation of the Columbus, Marion & Bucyrus Railway, Marion, Ohio, since the sale of the property in May, 1913, has been elected president and general manager of the reorganized company.

Mr. Charles Whipple Smith, Boston, Mass., has been elected treasurer of the Boston Suburban Electric Companies, succeeding the late Alden E. Viles. Vacancies in the board of trustees caused by the deaths of Mr. Viles and the late Frank A. Day, of Newton, Mass., have not been filled.

Mr. Frank Irvine, professor of law at Cornell University, was nominated by Governor Glynn for appointment to the Public Service Commission of the Second District of New York just before the close of the legislative session of March 28, 1914, and the appointment was confirmed by the Senate.

Mr. H. Hobart Porter, of Sanderson & Porter, New York, N. Y., will be elected president of the American Water Works & Electric Company, Pittsburgh, Pa., which is to succeed the American Water Works & Guarantee Company, the plans for the reorganization of which are referred to at length elsewhere in this issue.

Mr. W. N. Smith, who has been connected recently with the Edison Electric Illuminating Company, Boston, Mass., and who was formerly electric traction engineer of Westinghouse, Church, Kerr & Company, New York, N. Y., has accepted a temporary engagement with the San Francisco-Oakland Terminal Railways, Oakland, Cal. Mr. Smith will do consulting work for the company, assisting Mr. A. W. McLimont, the new general manager. This work will occupy Mr. Smith until June 1 or July 1, 1914.

Mr. D. H. Howard has been appointed engineer of maintenance of way of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill. Mr. Howard was graduated from Purdue University as a civil engineer, and prior to accepting this new position was connected with the maintenance of way departments of the Pennsylvania Railroad Lines West of Pittsburgh, the Southern Pacific Railroad in Texas, and with the Chicago & Western Indiana Railroad on track elevation through Chicago. In his new position he reports to Mr. C. J. Jones, superintendent of transportation and chief engineer.

Mr. H. M. Kochersperger, vice-president of the New York, New Haven & Hartford in charge of finance and accounting and vice-president of the Connecticut Company, has resigned on account of ill health. He has been granted leave of absence until July 1 next, after which he will draw a pension under the company's rules. His duties in the accounting department will be assumed by Mr. J. M. Tomlinson, general auditor, and in the financial department by Mr. A. S. May, treasurer. Mr. Kochersperger has been with the New York, New Haven & Hartford Railroad for twenty-seven years. For six years prior to that he had been with the old New England Railroad. From May 1, 1887, to January, 1904, he was comptroller; from Jan. 1, 1904, to Nov. 16, 1906, he was third vice-president, and on Nov. 17, 1906, he was elected vice-president.

Mr. George M. Schulz was nominated by Governor Glynn for appointment to the Public Service Commission of the First District of New York just before the close of the

legislative session of March 28, 1914, and the appointment was confirmed by the Senate. Mr. Schulz succeeds Mr. John E. Eustis, whose term of office has expired. He is forty-five years old and a native of New York City. He was educated in the public schools and was graduated from the College of the City of New York in 1892 and from the New York Law School two years later. He was admitted to the bar at once. Mr. Schulz was elected surrogate of Bronx County on the democratic ticket last year. Before that he was a city magistrate, having been appointed by the late Mayor Gaynor. He had represented the district in which he lives in the Assembly and in the Senate.

OBITUARY

Nathaniel Ewing, chairman of the Public Service Commission of Pennsylvania and noted jurist, is dead. Judge Ewing was born in Uniontown, Pa., on June 17, 1848. He was graduated from Princeton in 1860. He served on the bench in Fayette County and was chosen a member in 1908 of the State Railroad Commission, which was supplanted by the new Public Service Commission created by the last Legislature. Governor Tener appointed him chairman of the new commission.

Safety Calendar in Brooklyn

The Brooklyn Committee of Public Safety-Brooklyn Rapid Transit System has distributed to the public schools in Brooklyn with the approval of the Board of Education copies of a children's safety crusade calendar for 1914, one calendar being intended for display in each class room. The calendars are 21½ in. wide by 27 in. high. At the top of each of the twelve sheets a space 14 in. high by 18 in. wide has been reserved for the display of a picture showing the consequences of too little thought on the part of children and others in crossing streets and in boarding cars and alighting from them. The calendar proper giving the days of the month, etc., occupies a space 12½ in. wide by 8½ in. high under the display picture, and the calendar proper is flanked on either side with a sentence of warning based on the picture at the top, displayed in a box 3 in. wide by 8½ in. high. In one or two instances the sentences were interdependent; that is, they read over from the left side to the right side of the calendar. The warnings displayed on the calendar follow:

"Never play games across car tracks."
 "Your own fun may cost another's life."
 "Never spoil your fun by taking a chance."
 "You can't always let go when you wish."
 "Safe way to board: Grip handle with right hand."
 "Safe way to alight: Grip handle with left hand."
 "Look both ways before crossing street."
 "Eyes can't guard if you don't use them."
 "Runaway horses only one of many dangers."
 "Street belongs to wagons, autos, trucks and trolleys."
 "This also could happen playing 'cat.'"
 "Better lose the game than lose a leg."
 "When a small machine meets a big machine, which one suffers the greater injury?"
 "He did not wait until car stopped."
 "Your life may pay for undue haste."
 "Broken wires may be life wires. When you find one call policeman."
 "All persons have safety duties."
 "Never risk neglecting your own."
 "You may be struck by speedy autos even if you land on your feet."
 "Auto may turn out, street car cannot. Safe way: Always let them pass."

The New York Press on March 8, 1914, published in its magazine section an illustrated article on the safety work being carried out by the Brooklyn (N. Y.) Rapid Transit Company in Brooklyn, under the direction of Mrs. Jessie P. McCall, secretary of the Brooklyn committee of public safety and director of the safety campaign in the public schools. Some of the illustrations were the same as those used in connection with the extended article on this work which appeared in the ELECTRIC RAILWAY JOURNAL of Dec. 13, 1913, page 1222.

Construction News

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

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

RECENT INCORPORATIONS

*City Railway, Mount Vernon, Ill.—Incorporated in Illinois to build an electric railway. Capital stock, \$40,000. Incorporators: L. G. Pavey, C. C. Baldwin and Earl Green.

*Salisbury Interurban Railway, Annapolis, Md.—Application for a charter has been made by this company in Maryland to build an electric railway and other public utilities in Wicomico County. The railway will extend from Nanticoke Point, on the Nanticoke River, on the west side of Wicomico County, to Willards on the east side of the county, via the different towns and villages. The company asks for power to build lateral branches in any part of the county. Incorporators: E. Riall White, H. James Messick, Wade H. Bedsworth, Raymond K. Truitt, Henry W. Ruark, Wade H. Insley and Mark Cooper, all of Wicomico County.

*Ithaca (N. Y.) Traction Corporation.—Chartered in New York to take over the property and franchise of the Ithaca Street Railway, which was sold under foreclosure, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 31, 1914, page 282. Capital stock, \$1,000,000.

*Newark, Williamson & Northern Railroad, Newark, N. Y.—Application for a charter has been made by this company in New York to build a 15-mile electric railway between Newark and Williamson. Capital stock, \$150,000. Headquarters: Newark. Directors: Ernest I. Edgecomb, vice-president of the Newark & Marion Railway; Harry J. Clark, purchasing agent of the Newark & Marion Railway; J. Leslie Kincaid, John F. Durston, George A. Smith, Frank E. Young, all of Syracuse; Harold C. Beaty, Skaneateles, and Judson L. Transue and Willis P. Rogers, Williamson.

*Meigs Valley Traction Company, Caldwell, Ohio.—Incorporated in Ohio to build an electric railway. Capital stock, \$20,000. Incorporators: C. S. Carr and others.

*Ardmore (Okla.) Electric Railway.—Chartered in Oklahoma to build a 7-mile electric railway in Ardmore and its suburbs. It will furnish power for lighting purposes. Capital stock, \$100,000. Incorporators: George A. Craven, James C. Mort and John F. Easley, Ardmore and Asa B. Hale and William Craven, Milton, Iowa.

*Eastern & Western Railroad, Easton, Pa.—Chartered in Pennsylvania to build a 4½-mile interurban railway from Easton to Hopes Lock. Capital stock, \$50,000. Incorporators: George F. Baer, president of the Philadelphia & Reading Railway; R. W. De Forrest, W. G. Besler, T. W. Coons, E. J. Fox, W. E. Chipman and Horace Lehr.

*Uvalde & Northern Railroad, Uvalde, Tex.—Chartered in Texas to build a 55-mile electric or steam railway from Uvalde to a point at or near the headwaters of Camp Wood Creek in Real County. Capital stock, \$60,000. Incorporators: L. J. Smith and E. H. McVey, Kansas City, Mo.; L. J. Wardlaw, Sonora, Tex.; Fred C. Adams, Will A. Morriss, W. P. Brice, J. J. Ford, S. P. Skinner and Sidney Turner, San Antonio, and R. C. Walker, Austin, Tex.

FRANCHISES

Birmingham, Ala.—The Birmingham Railway, Light & Power Company has received a franchise from the Council for a line from its terminal on Fifteenth Avenue along that thoroughfare and Norwood Boulevard to Thirty-fifth Street.

Danville, Ill.—The Danville, Crescent & Kankakee Traction Company has asked the Council for a franchise in Danville. This line will connect Danville, Crescent City and Kankakee. E. E. Mayer, Crescent City, president. [E. R. J., Jan. 17, '14.]

Cumberland, Md.—The Cumberland Electric Railway has received a franchise from the Council to extend some of its lines in Cumberland.

Batavia, N. Y.—The Batavia Traction Company has received a fifty-year franchise from the Council in Batavia. Stephen W. Brown, Batavia, is interested. [E. R. J., March 21, '14.]

Bartlesville, Okla.—The Union Traction Company, Independence, has received a franchise from the Council in Bartlesville.

Barrie, Ont.—The Toronto, Barrie & Orillia Railway has received a franchise from the Council in Barrie. The Ontario Legislature is being asked to authorize the company to increase its bond issue and to extend the time for construction. [E. R. J., Jan. 31, '14.]

Guelph, Ont.—The Guelph Radial Railway has received from the Ontario Legislature an extension of time on its franchise within which to complete a number of authorized lines in Guelph and it has also received authority to build several extensions.

Ottawa, Ont.—The Rainy River Radial Railway has asked the Canadian Parliament for an extension of time to build its railway authorized by Chapter 152 of the statutes of 1910. Lewis & Smellie, Ottawa, Ont., are solicitors for the applicants. [E. R. J., Jan. 18, '13.]

Port Arthur, Ont.—The Port Arthur Street Railway will ask the Ontario Legislature for a franchise to extend this line to McIntyre, Gorham and Ware.

Houston, Tex.—The Houston Electric Company has asked the Council for a franchise to double track Main Street from Capitol Avenue to Dallas Avenue in Houston.

Salt Lake City, Utah.—The Utah Light & Railway Company has asked the County Commissioners for two extensions of its lines in Salt Lake City. One franchise calls for the extension of the Holliday interurban line from its present terminal to the power station of the company in the mouth of Big Cottonwood Canyon. The other contemplates an extension of the Seventh East or Wandamere line from the city limits to Fourteenth South Street, and thence west on Fourteenth South to a connection with the State Street line in Salt Lake City.

Medical Lake, Wash.—The Washington Water Power Company has received a franchise from the Council for an extension on Jefferson Street in Medical Lake.

TRACK AND ROADWAY

Birmingham Railway, Light & Power Company, Birmingham, Ala.—This company and the Jefferson County Commissioners will construct a reinforced concrete bridge over Village Creek at Twenty-sixth Street in Birmingham at a cost of \$6,000.

Alabama City, Gadsden & Attalla Railway, Gadsden, Ala.—An extension of the Walnut Street line from Twelfth Street to the site of the Gulf States Steel Company's plant in Gadsden will soon be built by this company.

San Joaquin Light & Power Company, Bakersfield, Cal.—An extension of this company's lines to the new Taft School in Taft will be built at once.

Fresno (Cal.) Interurban Railway.—Announcement has been made by J. B. Rogers, promoter of this interurban railway, that work will be begun at once on the line between Fresno and Clovis. It is planned to connect this line with the lines of the Fresno Traction Company in the city limits of Fresno.

Fresno, Clovis & Academy Interurban Railway, Fresno, Cal.—Work will be begun at once by this company on its 24-mile line between Fresno, Clovis and Academy. F. S. Granger, Clovis, president. [E. R. J., Feb. 28, '14.]

San Francisco-Oakland Terminal Railways, Oakland, Cal.—Work has been begun by this company on the broad-gaging of the branch line from Lorenzo Junction, on East Fourteenth Street, to San Lorenzo. The change will obviate the necessity of changing passengers at the junction and will permit the running of through cars to San Lorenzo. The branch is 1 mile long.

Geary Street Municipal Railway, San Francisco, Cal.—The contract for building the municipal railway on Van Ness Ave. and Chestnut St. in San Francisco, has been awarded to Mahoney Bros., San Francisco. They are to lay the tracks and install the concrete trolley poles and underground conduits, all of the materials being furnished by the city.

San José (Cal.) Terminal Railway.—An effort to revive this project, a proposed line between San José and Alviso, was made at the last meeting of the Mayor and Common

Council, when Judge F. G. Brown, San Francisco, and E. M. Landis, of the Tidewater & Southern Railroad, submitted two ordinances which were given first reading. The original franchise was granted Jan. 3, 1912, and some work was done, but the time for competition elapsed some months ago. One of the ordinances introduced extends the time to Jan. 1, 1915. The second ordinance is for a franchise for a connecting line in this city, beginning at Second Street and St. James Street, thence to the Guadalupe Creek, to Santa Clara, to Vine and south to the city limits of San José.

Sacramento Valley West Side Electric Railway, Willows, Cal.—This company has awarded a contract to the J. Hughes Construction Company, San Francisco, for grading the 12½-mile section of its line from Dixon south to a connection with the Oakland, Antioch & Eastern Railroad. This line will ultimately be extended through the west side of the Sacramento Valley to Red Bluff. H. R. Timm, Dixon, secretary. [E. R. J., Feb. 14, '14.]

Jacksonville (Fla.) Traction Company.—A 3½-mile extension to Black Point Park will be constructed by this company in the near future.

Savannah (Ga.) Electric Company.—During the next few weeks this company expects to rebuild 1½ miles of its line in Savannah. Material for the reconstruction is on hand.

Kankakee (Ill.) Electric Railway.—During the next six weeks this company will award contracts to build 1000 ft. of new roadbed and track on the south side of the river. It will also build a ½-mile extension with new rails in the Merchants' subdivision.

***Kewanee, Ill.**—Plans are being made to begin surveys soon for a 35-mile electric railway from Kewanee southeast via Bradford to Henry. C. G. Lampman, Cedar Rapids, Ia., and associates are interested.

Chicago, Waukegan & Fox Lake Traction Company, Sycamore, Ill.—During the next four months this company will award contracts to build a line to Woodstock.

Tri-State Traction Company, Warsaw, Ill.—This company, incorporated to build an electric line from Quincy to Hamilton, has filed amended articles of incorporation to extend the line to East Burlington, directly opposite Burlington, Ia., on the Mississippi River. J. Henry Bastert, Quincy, is interested. [E. R. J., Feb. 15, '13.]

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company has notified the Board of Public Works that it will put in new track work and paving at the intersection of Capitol Avenue and Washington Street, Pennsylvania and Ohio Streets, and at Illinois and Washington Streets, at an expense of about \$50,000. The company also expects to repair its track and the paving between the tracks in Washington Street, from Delaware Street to Noble Street, in Indianapolis.

New Albany & French Lick Valley Traction Company, New Albany, Ind.—This company advises that surveys have been completed for its 53-mile line between New Albany and French Lick. It has not yet decided when construction will be begun. John H. Martin, Palmyra, president. [E. R. J., Mar. 21, '14.]

Union Traction Company, Independence, Kan.—Work will shortly be begun by this company on its extension from Coffeyville to Nowata.

Salina, (Kan.) Street Railway.—During the next six weeks this company will award a contract for about 100 tons of rails to be used for reconstruction work. Within the next few weeks this company will rebuild about 1 mile of track and plans are being made to build about 1½ miles of new track to the Country Club and cemetery, via Oak Dale Park.

Louisville (Ky.) Railway.—Work has been begun by this company on the reconstruction of its lines on Main Street, relaying them with heavy foundations, preliminary to the reconstruction of the street by the city.

Orleans-Kenner Electric Railway, New Orleans, La.—Grading has been completed on 12 miles of this line and tracklaying is about to be begun. This is part of a plan to build an electric railway to connect New Orleans, Kenner and Hanson City. A. Smith Bowman, New Orleans, president. [E. R. J., Dec. 20, '13.]

Rockland, South Thomaston & St. George Railway, Rockland, Me.—About May 1 this company will award contracts to build 2800 ft. of new track in Rockland.

***Fenton, Mich.**—Henry Hoover and associates are considering plans to build a 60-mile electric railway between Fenton and Howell.

Minneapolis & Central Minnesota Railway, Minneapolis, Minn.—Grading has been completed on the 12-mile section of this line between Robbinsdale and Champlain and plans are being made to award contracts soon to build this 70-mile railway between Minneapolis and St. Cloud. E. G. Potter, 433, Andrews Building, Minneapolis, president. [E. R. J., Dec. 13, '13.]

Niobrara, Sioux City & Omaha Railway, Omaha, Neb.—Surveys have been completed, most of the right-of-way secured and arrangements are being made by this company to begin work in June on the interurban electric railway which will extend from Omaha to Elk City and thence on to Norfolk, with a branch from Elk City to South Sioux City, from South Sioux City to Niobrara and from Niobrara to O'Neill, with a cross line from West Point to Decatur. Orders for equipment will be placed as soon as the Railway Commission issues its certificate of authority to the company to sell bonds and stocks. Charles W. Baker, Omaha, is interested. [E. R. J., July 12, '13.]

Trenton & Mercer County Traction Corporation, Trenton, N. J.—An extension from Yardville to Crosswicks will soon be built by this company.

Ontario Light & Traction Company, Canandaigua, N. Y.—This company is asked to consider plans to extend its West Avenue line southward from the end of West Avenue through Lincoln Avenue to Chili Avenue in Gates.

***Mandan, N. D.**—It is proposed to build an electric line to connect Mandan, Yuco, Center and into Dunn County.

Ohio Traction Company, Cincinnati, Ohio.—Plans are being made by this company to extend its lines in Hartwell and Carthage.

Lake Shore Electric Railway, Cleveland, Ohio.—It has been announced that this company will spend \$100,000 in straightening curves and making improvements on its line between Huron and Rye Beach. The line will be built on a private right-of-way and will make the running time ten minutes between Sandusky and Cleveland. Construction work will begin within a few days and will be finished about Aug. 1.

City Railway, Dayton, Ohio.—An extension of the Third Street line in Dayton along Smithville Road for 1 mile is being considered by this company.

Youngstown & Sharon Railway & Light Company, Youngstown, Ohio.—An extension is being built by this company to its new freight station at Hubbard Junction.

Aylmer, Ont.—Sentiment in favor of Hydro-Electric Radial Railways in Aylmer district crystallized in a gathering in the town hall on March 16. The speakers included Hon. Adam Beck, chairman of the hydro-electric power commission of Ontario; J. W. Lyon, Guelph, Ont., chairman of the hydro-electric union of Ontario; Philip Pocock, chairman of the London, Ont., water commission, and Dr. Sinclair, Aylmer, Ont. London and Port Burwell have asked the commission to have its engineers make a survey, and a number of such petitions were handed to Mr. Beck, who assured his hearers that a fully equipped survey party of engineers was to be expected about March 24.

Brantford, Ont.—Brantford ratepayers have voted in favor of the purchase of the Brantford Street Railway and the Grand Valley Railway from Brantford to Galt.

Peterborough (Ont.) Radial Railway.—This company plans to build several extensions during the summer. The city is laying 1 mile of pavement along the business street and the company is removing its old tracks from this portion of its system and replacing them with new rails. It is also running a siding to the Canadian Pacific Railway depot.

Toronto (Ont.) Railway.—The board of control has approved of a plan for this company's proposed railway to the eastern entrance to the exhibition grounds.

Sandwich, Windsor & Amherstburg Railway, Windsor,

Ont.—This company is rebuilding with 80-lb. rails and paving about 1½ miles of its line in Windsor and in Sandwich.

***Windsor, Ont.**—Mayor Clay announced on March 20 that he would take immediate steps to bring about the building of a municipal electric railway in Windsor.

***Drewsey, Ore.**—A company has been organized for the purpose of building an electric railway from Riverside up the Malheur River to Drewsey and the Logan Valley. Power will be obtained from John E. Johnson & Sons, the promoters of the power project on the Malheur River. Officers: J. L. Sitz, president; I. M. Davis, vice-president; W. D. Baker, secretary, and C. W. Drinkwater, treasurer.

Portland Railway, Light & Power Company, Portland, Ore.—Extension of the proposed cross-town car line from the north end at Mason Street to Alberta Street, there to connect with the Alberta car line, is being considered by this company.

Harrisburg (Pa.) Railways.—During the next few weeks this company plans to rebuild between 2 and 3 miles of city track. All material has been purchased.

Wayne County Street Railway, Honesdale, Pa.—Preliminary arrangements are being made by this company to begin work soon on its 20-mile electric railway from Hawley along the old canal bank through Tanner's Falls, White Mills, Indian Orchard and Beach Lake to Main Street in Honesdale. Plans call for concrete ties, 70-lb. rails and permanent pavements. Six bridges with concrete abutments will be put in. John I. Riegel, Scranton, chief engineer. [E. R. J., June 7, '13.]

Moose Jaw (Sask.) Electric Railway.—Plans are being made by this company to extend several of its lines in Moose Jaw.

Greenville, Spartanburg & Anderson Railway, Greenville, S. C.—This company has placed in operation its line between Greenville and Spartanburg, a distance of 90 miles.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—During the next few weeks this company plans to build a 1-mile extension in Chattanooga. All material has been provided for.

Nashville (Tenn.) Traction Company.—This company is making plans for a large amount of work for the current year, a large part of which will be handled in connection with the steam railroads and city authorities, this being especially true of bridge work.

El Paso (Tex.) Electric Company.—C. E. Kellogg, general manager of this company, states that for some months it has been known that plans were being fostered for the construction of an interurban electric railway line up the Rio Grande Valley perhaps as far as Las Cruces, New Mexico. But when questioned as to whether or not the construction of an addition to the power plant and the installation of new machinery meant that the interurban would likely be constructed, Mr. Kellogg said that the \$350,000 improvements had no bearing on such a line up the valley. He added that he did not think the time for such a line was opportune for about at least two years.

Utah Light & Railway Company, Salt Lake City, Utah.—Tentative plans have been drawn by this company for two proposed routes to connect Salt Lake and Ogden with an interurban line, to be an extension of the present line running to Centerville. Only 5 miles of the line will be finished this year—the extension from Centerville to Farmington—but in next year's budget money for the entire road will be included and Salt Lake and Ogden will be connected with another interurban line during 1915, making four railroads between the two cities. Two routes to Ogden are designated in the tentative plans which have been drawn up by L. L. Dagron, chief engineer of the Utah Light & Railway Company.

Milwaukee Western Electric Railway, Milwaukee, Wis.—Surveys are being made and grading will soon be begun by this company for a line from Milwaukee to New Butler.

Sheboygan Railway & Electric Company, Sheboygan, Wis.—Plans are being made to rebuild this company's lines between Sheboygan and Sheboygan Falls in the near future.

SHOPS AND BUILDINGS

Savannah (Ga.) Electric Company.—During the next few weeks this company plans to rebuild with fireproof construction its carhouse on Gwinnett and Ott Streets in Savannah.

Niobrara, Sioux City & Omaha Railway, Omaha, Neb.—The plans of the company contemplate the expenditure of \$1,000,000 to \$1,500,000 in Omaha on terminals and a passenger and freight depot, the site of which has not been decided upon, though it has been determined that these terminals must be near the business center of the city.

Youngstown & Sharon Railway & Light Company, Youngstown, Ohio.—This company will abandon its old depot in Hubbard, and the dispatcher's office, passenger station and freight office will be transferred to the new brick building at Hubbard Junction, a part of which is used as a substation for the company.

Portland Railway, Light & Power Company, Portland, Ore.—Plans are being formulated for alterations to be made in this company's main offices at Alder Street and Broadway in Portland. The improvements will cost about \$15,000.

Southern Traction Company, Dallas, Tex.—Plans are being considered by this company to build a new passenger station and transfer station at Comal Street and Jefferson Avenue in Dallas. The structure will be of ornamental brick construction.

POWER HOUSES AND SUBSTATIONS

United Railroads, San Francisco, Cal.—This company's store room at its power house in San Francisco was damaged by fire on March 20. The loss is estimated to be about \$1,000.

Kankakee (Ill.) Electric Railway.—During the next six weeks this company plans to purchase a new boiler with a capacity of 250 hp.

Baton Rouge (La.) Electric Company.—Plans are being considered by this company for the removal of its power plant in Baton Rouge to a point on the river front which will be more accessible to the railway.

Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for one 300-kw rotary converter.

Public Service Railway, Newark, N. J.—This company has ordered two 20,000-kw turbo-generators from the General Electric Company for its new power station at Newark.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company has awarded the following contracts for the equipment of its new power station at Lowellville: General Electric Company, one 1000-kw motor-generator set and miscellaneous switchboard equipment, one Westinghouse 1500-kw transformer and two 2500-kw transformers with switchboard equipment; Edge Moore Iron Company, three 600-hp boilers with Foster superheaters; P. F. Shaw, piping; Vulcan Soot Cleaning Company, soot cleaners; A. & S. Wilson, builders; Canady Combustion Company, combustion controllers; American Engineering Company, stokers.

Ottawa (Ont.) Electric Railway.—Two new substations have just been put into operation by this company, at a cost of \$60,000 each. One of these stations is on Nelson Street, near Rideau, designed to supply increased power to the eastern section of the city; the other is on Center Street to supply the southwestern district of Ottawa.

Toronto Suburban Railway, Toronto Junction, Ont.—This company has awarded a contract to the Canadian General Electric Company for substation apparatus and car equipments, for the new line from Toronto to Berlin. There will be three substations; 1500-volt rotary converters, each of 500-kw capacity, will be used, power being transmitted to the substations at 25,000 volts.

El Paso (Tex.) Electric Company.—Important improvements have been begun at this company's power plant. A new 5000-kw turbo-generator is to be installed to supply the additional power needed in El Paso and the Rio Grande Valley for industrial and agricultural purposes.

Manufactures and Supplies

ROLLING STOCK

Jacksonville (Fla.) Traction Company has built a wrecking car in its own shops.

Keokuk (Ia.) Electric Company has ordered one car from the American Car Company.

Mansfield Railway, Light & Power Company, Mansfield, Ohio, expects to purchase three single-truck city cars.

Columbus (Ga.) Railroad expects to purchase three semi-convertible single-truck cars within the next six weeks.

Bloomsburg & Millville Street Railway, Bloomsburg, Pa., is contemplating the purchase of about three closed motor passenger cars.

Chicago, Waukegan & Fox Lake Traction Company, Sycamore, Ill., expects to purchase new cars within the next four months.

St. Joseph Valley Railway, Elkhart, Ill., has ordered one 54-ft., 150-hp, 40-passenger motor car from the Hall-Scott Motor Car Company.

Moncton Tramways, Electricity & Gas Company, Ltd., Moncton, N. B., will probably purchase several new single-truck cars during the year.

Houston (Tex.) Electric Company, noted in the ELECTRIC RAILWAY JOURNAL of Jan. 17, 1914, as expecting to purchase ten double-truck cars, has ordered these cars from the American Car Company.

El Paso (Tex.) Electric Railway, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 7, 1914, as expecting to purchase six closed 32-ft.-4-in. city cars, has ordered these cars from the St. Louis Car Company.

Northern Texas Traction Company, Fort Worth, Tex., noted in the ELECTRIC RAILWAY JOURNAL of Jan. 24, 1914, as being in the market for twenty cars, has ordered these cars from the American Car Company.

United Railways & Electric Company, Baltimore, Md., has ordered eighty-five semi-convertible pay-as-you-enter cars from The J. G. Brill Company. The cars will be equipped with closed vestibules and folding steps.

Pacific Great Eastern Railroad has ordered one 65-ft., 250-hp, 52-passenger motor car from the Hall-Scott Motor Car Company, and three trailer cars from the Canadian Car & Foundry Company, Ltd., for use with the motor cars.

Canadian Northern Railroad, Toronto, Ont., is sending out inquiries for equipment for eight all-steel passenger cars to be operated in suburban service upon completion of the electrification of the Montreal tunnel and terminal.

Bryan & Central Texas Interurban Railroad, Bryan, Tex., has ordered from the Hall-Scott Motor Car Company two passenger motor cars, each 52 ft. 4 in. long, with 100-hp motors, and each having a capacity of seventy-two passengers.

Harrisburg (Pa.) Railways, noted in the ELECTRIC RAILWAY JOURNAL of March 21, 1914, as contemplating the purchase of new cars, expects to purchase ten cars during the summer. Specifications will not be ready for at least thirty days.

Easton (Pa.) Transit Company has ordered nine pay-within, semi-convertible, single-truck cars from The J. G. Brill Company, not six, as incorrectly stated in the ELECTRIC RAILWAY JOURNAL of Feb. 21, 1914. The following details are specified:

| | | | |
|------------------------|-------------------------|-----------------------|----------------|
| Seating capacity..... | 32 | Destination signs.... | Hunter |
| Weight..... | 12,900 lb. | Fenders..... | H. & B. |
| Length of body.... | 20 ft. 8 in. | Gears and pinions.... | Gen. Elec. |
| Width over sills.... | 7 ft. 10½ in. | Gongs..... | Adams Westlake |
| Width over all.... | 8 ft. 2 in. | Hand brakes..... | Peacock |
| Height, rail to floor, | | Heaters | Consol. |
| | 33 15-16 in. | Headlights.... | United States |
| Body | wood | Journal boxes..... | Brill |
| Interior trim, | | Motors..... | G. E. 67-2 |
| | cherry stained mahogany | Registers | International |
| Headlining | Agasote | Sanders | Brill |
| Roof | arched | Sash fixtures..... | Brill |
| Underframe | metal | Seats..... | Brill winner |
| Bumpers | Brill | Springs | Brill |

Car trimmings.....Brill Step treads.....Mason
ControlK-10 Trolley base....Nuttall 13-D
Curtain fixtures, Trucks.....Brill 21-E
Cur. Sup. Co. Ventilators..Railway Utility
Curtain material..Pantasote Wheels.....Schoen 33-in.

TRADE NOTES

Holland Trolley Supply Company, Cleveland, Ohio, has appointed E. W. Backert sales manager of the company.

Eagle Smelting & Refining Works, New York, N. Y., has removed its offices to the Woolworth Building, New York, N. Y.

Universal Safety Tread Company, Waltham, Mass., has moved its main office from 141 Milk Street, Boston, to Waltham.

Peter Smith Heater Company, Detroit, Mich., has moved its offices and factory from 88 Isabella Street to 1725 Mt. Elliott Avenue.

Meikleham & Dinsmore, New York, N. Y., bankers, have appointed W. J. Kearney as their representative for the State of Maine with headquarters at their Boston office, 35 Congress Street.

H. W. Johns-Manville Company, New York, N. Y., has appointed Fred B. Smith as assistant to the president, T. F. Manville. For many years Mr. Smith has been secretary of the international committee of the Young Men's Christian Association.

Scholey & Company, Ltd., London, England, have received from the Maschinenfabrik Oerlikon an order for their special tool steel gear wheels and pinions for the motor equipments to be used in the electrification of the London & North Western Railway.

Continental Railway Supply & Equipment Company, Chicago, Ill., has been organized with a capital stock of \$300,000 for the manufacture and sale of railway equipment and supplies. Oglesby Allen, Jr., Joseph P. Williams and Thomas P. McDonough are interested.

Ohmer Fare Register Company, Dayton, Ohio, on March 23 held its semi-annual banquet. Cash prizes were distributed for suggestions made in regard to improvements in manufacture and for the welfare of employees. Talks were given by John F. Ohmer, president of the company, and others.

General Electric Company, Schenectady, N. Y., has received orders for the following car equipments: Washington, Baltimore & Annapolis Electric Railroad, five GE-233, 70-hp, 600-1200-volt four-motor car equipments; Philadelphia & Garrettford Street Railway, five GE-203, 50-hp four-motor equipments.

Hunter Illuminated Car Sign Company, Flushing, N. Y., was awarded the contract for destination signs on the six interurban cars which are being built by the Preston Car & Coach Company for the Niagara, St. Catharines & Toronto Railway. This item is a correction of the list of specifications for these cars in the ELECTRIC RAILWAY JOURNAL of March 28, 1914, which stated erroneously that the Electric Service Supplies Company had received the order for destination signs.

Roller-Smith Company, New York, N. Y., announces that in addition to its branch offices at 740 Monadnock Block, Chicago, and 711 Williamson Building, Cleveland, Ohio, it now has additional representatives as follows: Boston, Tompkins-Stoddard Company, 77 Franklin Street; Detroit, H. I. Shire, 1310 Majestic Building; Minneapolis, W. W. Geisse Company, McKnight Building; New Orleans, John S. Black, 908 Hennen Building; Portland, Ore., G. L. Priest, 229 Sherlock Building; San Francisco, H. B. Squires Company, 579 Howard Street.

Curtain Supply Company, Chicago, Ill., has appointed Walter Bentley to a position in the concern. Mr. Bentley's father, H. T. Bentley, is superintendent of motive power of the Chicago & Northwestern Railway, and has a high standing among railroad men, being past president of the American Master Mechanics' Association, also the Western Railway Club. Mr. Bentley saw to it that his son had a thorough railway training. Beginning in the stores department, Walter Bentley worked his way through almost all branches of railroad work, having served in the different departments

of the shops and roadmaster's, general superintendent's and purchasing agent's offices. In the last few years he has represented the Baldwin Locomotive Works and the Standard Steel Works Company.

ADVERTISING LITERATURE

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued a catalog describing its ball-bearing hangers.

American Vulcanized Fibre Company, Wilmington, Del., has issued a catalog entitled "From Field to Fibre," describing and illustrating its fibre shims for insulating steel ties, fish plates and a large number of other uses requiring both dielectric and mechanical strength.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued Bulletin E-32 describing Duntley electric tools for interurban and street railways. These tools include track drills, heavy duty side spindle drills, center-spindle drills, angle gears, portable electric grinders and electric spike drivers. Bulletin E-31 describes electric drilling stands.

Niles-Bement-Pond Company, New York, N. Y., has issued a circular describing and illustrating its new design, high production boring and turning mills. All changes of feed and reversal, rapid power traverse or hand adjustment of saddles and bars, also cross rail adjustment and table control are within reach from the operator's position. Power may be transmitted to the machines by d.c. motor, belt or a.c. motor drive.

Wagner Electric Manufacturing Company, St. Louis, Mo., has issued Bulletin No. 104, entitled "A Manual of Electric Testing." Besides describing the line of portable instruments issued by this company, the publication describes various types of electrical instrument movements, the errors to which they are subject, and gives suggestions for their handling and care. The methods of making electrical tests on alternating current and direct current motors and generators and on transformers are explained at length and illustrated by comprehensive diagrams.

Union Switch & Signal Company, Swissvale, Pa., has issued a catalog describing its recently introduced TDB or traffic direction block signal system, especially designed for interurban railways. Two cars are permitted between sidings, each in a separate block and protected head-on and rear by "absolute" signals with a minimum of apparatus. There is but one track circuit and four signals to each opposing block unit. The blocks for opposing cars do not coincide with the blocks for following cars. This system enables the operating rules to be of the simplest kind because but two signal indications, *stop* and *proceed*, are used and there are no preliminaries. The catalog contains short illustrated descriptions of installations on the Chicago, Lake Shore & South Bend Railway, 55 miles; Indianapolis, Columbus & Southern Traction Company, 22 miles; Chicago, South Bend & Northern Indiana Railway, 9.5 miles; Louisville & Northern Railway & Lighting Company, 3.5 miles; Ohio Electric Railway, 4.2 miles; Scranton & Binghamton Railroad, 10.1 miles; Kansas City, Clay County & St. Joseph Railway, 70.1 miles.

NEW PUBLICATION

How to Build Up Furnace Efficiency. Seventh edition. By Jos. W. Hays, combustion engineer. Jos. W. Hays, publisher, Rogers Park, Chicago, Ill. 126 pages. \$1.

In preparing this book for its seventh edition the author, whose sole effort, as in the previous editions, is to show managers, superintendents, engineers and firemen of power plants how they may actually work a real reduction in the coal bills, has altered his past method of exposition by treating the subject in a more popular style, so that the book will be more appreciated by the multitude of non-technical men who are anxious to get results first and who are content to let theories rest until results have been accomplished. With the above end in view, diagrams and illustrations, formerly lacking, are used to clarify some of the more complicated explanations in the text. Certain instruments and apparatus designed by the author are illustrated for the purpose of showing the apparatus which he has used in his combustion studies and in working out specific furnace efficiency problems in many plants.