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GEAR RATIOS AND POWER CONSUMPTION

The influence of railway motor gear ratios upon power consumption and schedule speed is unquestionably recognized, but it is doubtful whether the possible extent of the influence is thoroughly appreciated. On a run where but six or seven stops per mile are made and where schedule speed is moderate gear ratios may, of course, be relatively unimportant, but when the stops per mile rise to twelve or fourteen literally enormous savings or losses may be caused by comparatively small differences in the ratios used. This point was well brought out recently when it was found that on a certain run a car geared in the ratio of about 1:4.5 used some 20 per cent less power on the same run than one geared in the ratio of 1:3.5, the motors being of the same capacity in both cases. At first glance this seems to be unreasonable. Yet if it is known that the run required some twelve stops per mile with an interval between stops of 440 ft. the apparent discrepancy is explained at least in part. Allowing the small distance of 140 ft. for the retardation of braking before the stop, there is but 300 ft. left for acceleration, running and coasting, and as acceleration, with its controller losses, required 120 ft. with the high gear ratio against 70 ft. with the low one, the former nearly doubled the opportunity for wasting current in resistance and in reduced motor efficiency. In addition, the distance available for coasting, the most important means for saving power, was decreased 22 per cent.

THIS YEAR'S TECHNICAL GRADUATE

During the coming month a large number of new electrical engineers will receive their diplomas from the technical schools of the country and will be seeking occupation, many undoubtedly in the electric railway field. This industry is not growing so rapidly as it once was or, comparatively speaking, at as great a rate as some other fields of electrical enterprise. At the same time, the traffic carried by the electric lines of the country is increasing, even if there has not been recently a very large expansion in mileage, and the industry needs the services of every man who can help to solve its problems. If the new graduate should enter the electric railway field, he will soon find that the questions to be solved in it are not all of a technical character; indeed, some of the most important of them at present are, in our opinion, not directly allied to engineering, although an engineering education would be of considerable help to one who attempts their solution. Those who engage in such work as valuations, for instance, or some of the complicated problems of operation, must have a very much wider field of knowledge than that usually found in the engineering schools, and for valuations it is questionable whether a thorough training in finance and accounts is not a much more important preliminary qualification. It is unfortunate that an increase in the known facts in any branch of engineering necessarily means greater specialization in the technical schools where that branch of engineering is taught. To keep pace with the growth of the science itself subjects not closely allied with it are gradually lopped off from the curriculum, and the result is that the student emerges from his four years' course with more knowledge undoubtedly about one thing than that possessed at the same time by the graduate of ten years or more earlier but much inferior to the latter in his knowledge of related subjects. This, by itself, is not a handicap if the student recognizes the condition which exists, but he should realize that he must acquire either by study or practice the elements in which his training has been lacking. Otherwise he cannot be prepared to give as good service as if his education in the technical school had been of a broader character.

THE COMING PROBLEM OF VALUATION

The far-reaching possibilities of the forthcoming valuation of the railroads under the jurisdiction of the Interstate Commerce Commission were ably set forth at the May 22 meeting of the American Institute of Consulting Engineers, as noted in last week's issue. Ostensibly, the valuation is to be used as a basis for rate making, but more than one of the engineer economists at this meeting saw in this project the overture to the drama of public ownership. The possibility of this outcome again confirms Herbert Spencer's observation in "The Sins of Legislators" that laws which affect the social structure often result in changes undreamed of by their sponsors. The immensity of the task before the commission is evidently appreciated by men who have themselves led in the solution of problems calling for the highest degree of ability. To them the valuation of a railroad is not the cataloging of "a mass of inert objects," as aptly expressed by Mr. Wilgus, but an attempt to price a pulsating organism whose ganglia

extend into every part of the body social. The great discrepancies between the valuation figures of traction and municipal representatives in the case of St. Louis and other cities is fair warning that in evaluating steam railroads much will depend upon the cultivation of a broad and fair-spirited point of view. The great desideratum is that the authorities should treat the railroad investor with the same degree of justice that they do the capitalist in other fields whose increment is not questioned. There is no doubt in our minds that many of the states will follow the example set by Congress and during the next few years will require valuations of all of the public utilities within their jurisdiction. Whether a person believes that such valuations will be worth their cost or not, there is certainly a popular demand for them, and with the precedent set for the interstate carriers local valuations will undoubtedly follow. For this reason it is advisable for all electric railway companies to be prepared for such a contingency and keep their accounts so that such valuations can be most easily made.

RAILWAY PAPERS AT THE INSTITUTE

At the last meeting of the American Institute of Electrical Engineers two important papers on the electrification of main-line railways were presented by authors rich in experience of the heavier electric traction. Both attacked the problem in a broad way, taking account of the various elements of cost which enter the work of heavy electrification and particularly the effects of heavy grades in the freight traffic as handled by steam and by electric locomotives respectively. Finally, after a complete computation of the cost, both writers arrived at almost identically the same ratio between the complete operating cost with equal traffic by steam and by electricity. They agreed in setting the estimated cost of the electric operation at practically five-eighths of the cost of doing the same work by steam locomotives. This identity of results is the more interesting because Mr. Hobart was considering a special concrete case now on the way to completion, while Mr. Kahler considered another case, evidently also concrete, a road nearly five times the length of that considered by Mr. Hobart, with lighter average grades and more typical of main-line conditions as a whole.

Mr. Hobart reckoned on high-voltage d.c. locomotives and Mr. Kahler on the single-phase system, which makes their respective estimates all the more striking. One very noticeable feature of both is that they assumed the purchase of power from transmission systems at what is relatively a very low figure, 0.7 cent in one case and 0.75 cent in the other. In a large number of cases trunk-line roads will undoubtedly be able to secure transmitted power for their work, and in some instances at prices certainly as low as those quoted. It is perfectly plain, however, that the average road compelled to furnish its own power under the conditions of a scattered and none too heavy service would not stand a fighting chance of securing it, all charges paid, at the figures mentioned. Transmission from hydroelectric plants or from very large and favorably situated steam plants able to take the railway service as an incidental load are essential to the validity of the comparisons made in these papers. About the same general characteristics of performance are assumed for the locomotives in each case. Mr. Hobart on his assumptions of equipment and service found the transportation charges of the electric system about 85 per cent of those of the steam system. Mr. Kahler made the same relation about 67 per cent, a difference which is easily explicable on account of the differing nature of the two roads considered. In both cases the practical advantages of the electrical equipment are, first, the fact that the whole weight of the electric locomotive is on the drivers and available for tractive effort; second, that the electric locomotives can unquestionably make a greater mileage per year than the steam locomotives, and, third, that they also have a great advantage over the steam locomotives in the matter of repairs and continuity of service.

Now, as regards the first count, there is absolutely no doubt about the facts. The tractive effort of the locomotive, assuming full power supply, depends simply on the weight available for adhesion, and the electric locomotive here is most strikingly superior. For a given total locomotive weight it has about half as much again possible tractive effort as a steam locomotive of the same weight, and since the electric locomotive does not have to carry its power station on its back a very large power supply is available and considerable tractive effort at relatively high speed can be attained. As regards the second matter, as has just been shown, the practicable hauling power of the electric locomotive is available at a considerably higher speed, so that as regards daily mileage the electric machine can reasonably be counted on to make nearly double the distance per day practicable with the steam locomotive. Moreover, there seems to be no doubt, although this phase of the matter belongs in part to the next topic, that the electric locomotive will also be available for this duty a good many more days per year than a steam locomotive owing to the lesser amount of repairs, not necessarily of large repairs, but such as prevent its use on the road.

With respect to the serviceability of the electric locomotives data are scarce. We think there is absolutely no question that they can be depended on to be in service a considerably larger portion of the time than the steam locomotives, but, on the other hand, the only available data are those taken from roads which present anything but typical cases of trunk-line electrification, the only figures on any considerable scale being for work in and about the terminal systems of New York City. These are instructive in that the amount of service is considerable, but they throw very little light on the performance of even the same excellent locomotives in the rough-and-tumble work of everyday hard service doing the entire work of a through line. Admirable as these machines are, one must discount something for the contingencies of continuous and heavy service on an electrified trunk line or mountain division. We look, therefore, with a somewhat critical eye at the great difference in maintenance estimated in both the papers under consideration. This matter is one of the uncertain factors of the problem, and while there is little doubt that the electric locomotive has a material advantage, its magnitude cannot be predicted on any data yet available. The fact is, however, that the thing which checks the development of trunk-line electrification is not uncertainty regarding the

performance of the equipment nor doubt as to the probability of a very material saving, perhaps not so great as here indicated but yet enough to be fully worth while. The fundamental difficulty is the cost of the electrical equipment added to the burden of fixed charges under which most roads are already staggering. The condition of the average reputedly prosperous American road, to judge from the disclosures made of late with reference to wages and rates, is not such as to admit the immediate possibility of adding to the fixed charges even so modest a sum as the $17 per mile figured by Mr. Kahler. On the engineering side of the matter there now remains no serious doubt. It is the financial difficulty which stands in the way of progress.

THE ISSUES IN CLEVELAND

The Cleveland Railway and the city of Cleveland are seeking a settlement of various questions arising in connection with the ordinance under which the company operates. The proceedings have not the benefit of the attendance of Judge Tayler, who acted as arbitrator for both the city and the company when the ordinance was drawn and who would have been a logical interpreter of the contract had he lived. The members of the board of arbitration upon whom the important duty of expounding the spirit as well as the letter of the contract rests are Mr. Duffy for the company, Mr. du Pont for the city, and Judge Killits, of the United States Circuit Court, who is the third member.

The board, of course, is not to go back of the arrangement which was embodied in the ordinance of 1910. It is not asked to question the reduction in capital value of the company upon which the low-fare arrangement now prevailing in Cleveland is primarily predicated. It will not analyze the method of valuation followed when this reduction in capital value was forced by the city. It will take no cognizance of the fact that the owners of the capital stock were obliged to have their securities reduced to 55 per cent of what they were previously. It simply accepts the conditions of capital value and of settlement named in the ordinance and proceeds to interpret them without relation to the heavy loss of the company which preceded the present working arrangement.

Taking the capital value of the Cleveland property at the point to which it was cut, the ordinance provides for arbitrary charges per car mile for maintenance, depreciation and renewal and for other operating expenses. The justice of the claim of the company regarding the question of increase in the so-called operating expense allowance has already been conceded in part by the city. Mayor Baker has signified consent to an increase from 11½ cents to 12 cents per car mile for this purpose. Under the ordinance this amount is designed to cover operating expenses exclusive of charges for maintenance, depreciation and renewal. The company asks for 12½ cents in order that it may have a margin above its estimated probable cost and may use that margin in reduction of the present deficit in this fund. The city states that the company has not shown why its operating expenses have amounted to as much as the books indicate, but the facts are that it granted a car-mile allowance of 11½ cents when the ordinance was drafted, that the wages of trainmen have been increased since that time and that the city does not object to the wages paid. These wages amount to one-half of the car-mile allowance available. The language of the ordinance with reference to the treatment of deficits is as definite as it can be. The amounts may be increased or decreased from time to time so as to enable the company to meet legitimate expenses of operation and "to prevent or make good any deficit on account of such expenses."

A question of equal importance is that of the allowance per car mile to be deducted from revenues for maintenance, depreciation and renewal. The company has not only expended all of the car-mile allowance, it has over-expended this fund and it has no reserve for depreciation. The contract specifically provides for a maintenance, depreciation and renewal account. It does not fix any arbitrary division in the application of this fund for these different purposes. It does, however, by its inclusion of these terms recognize that depreciation is an element of expense that is allied with maintenance and renewal and that protection against its effect should be furnished. If the ordinance provided for maintenance alone, the question that the city raises as to whether the company has maintained the property in 70 per cent condition would be more appropriate. If the ordinance provided a car-mile allowance for maintenance and renewal alone, the application of this account still would be much less far-reaching than its framers apparently designed it to be. When the company shows that it has merely an empty deficit in place of a tangible balance it proves that it has no reserve whatever for future revelations of depreciation accruing daily.

In connection with the treatment of the operating expense fund, the city has raised issues in reference to the right of the company to set up reserves for insurance and damages. It asserts that these reserves have no right to existence beyond the close of each fiscal year. The amounts involved in each case are relatively small. The insurance reserve really seems to be a matter of administrative detail, and while its creation is necessarily more or less of an arbitrary procedure, since the company is carrying part of its own insurance, to the extent that it is doing so it is unprotected unless it has a reserve upon which to draw in the event of loss. The retention of an accident reserve represents an attempt on the part of the company to charge its current revenues with amounts approximating its unliquidated liability. This is much more than a matter of accounting procedure. No one who borrows without security at a bank is regarded as honest unless he lists his known liabilities. In the case of a street railway the liabilities are not determinable except as the experience of the past serves as a guide. The company is protecting itself properly against claims which may be presented late.

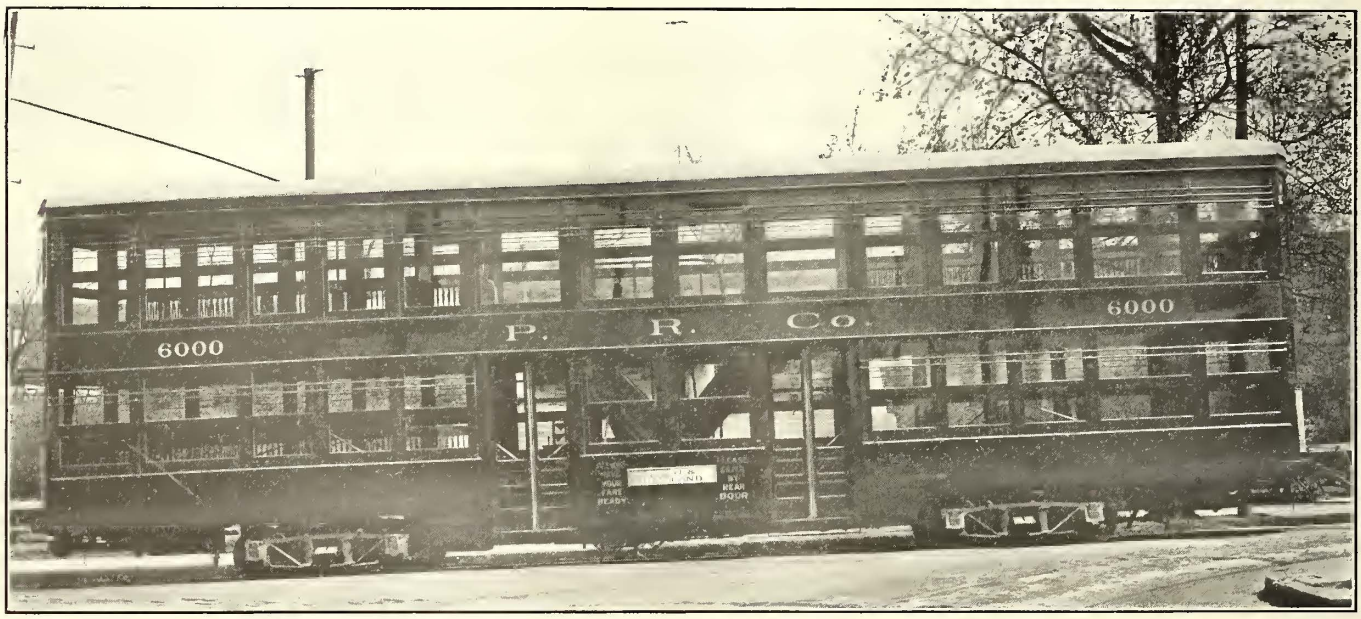
The wording of the ordinance is that the amounts at issue may be changed by agreement between the city and the company or, in the event of disagreement, by arbitration. This appears to imply that responsibility rests upon each party in the proceeding to prove its case and should relieve the extent of the burden upon the company in an arbitration. The proceeding, therefore, is not one in which the relations of the parties should be those of prosecutor and prosecuted, but one involving the definition of terms.

New Double-Deck Cars for Pittsburgh

The Double-Deck Principle, Which Was Revived by the Construction During the Past Year of Trial Cars of This Type for Several Different Cities, Has Now Passed the Experimental Stage, the Pittsburgh Railways Having Purchased Five of Them for Regular Service

The revival of interest in the double-deck car which occurred last summer on account of the simultaneous development of two widely different designs has been accompanied by much comment adverse to the practicability of the principle. These cars have been in experimental use for a year in various classes of service, and it is a significant fact that for certain traffic conditions in Pittsburgh the double-deck car has proved so advantageous that the Pittsburgh Railways has recently purchased five new cars of this type.

These cars are intended not alone for special service to parks, ball games, etc., but also for regular runs on one of the city lines. On this line, however, 75 per cent of the passengers are loaded at five points in the central part of the city. Contrary to the somewhat prevalent belief that the double-deck design involves an enormously high first cost, the quotations which were made for the five cars were found to be exceedingly low considering the increase in seating capacity. In fact, the actual price paid for each amounted only to approximately $1,500 more than the cost of a standard single-deck car.



Pittsburgh Double-Deck Cars—View of Original Car Showing Separate Exit and Entrance Doors

The general arrangement of the new cars follows quite closely the original design described in the Electric Railway Journal for Aug. 10, 1912, page 204, but as the original car was intended for experimental purposes only, a number of changes in the equipment and in the details of the design have been introduced by the inventor, P. N. Jones, general manager Pittsburgh Railways, who has applied for patents to cover the design.

General Arrangement

As in the original design, the new cars are carried on small wheels to permit the use of a low main floor which is only 28¾ in. above the rail. The center portion of the main floor is depressed to form a well from which the stairs extend to the upper deck and which also provides space for separate entrance and exit doors. The two stairways are located on either side of the car but face in opposite directions, the exit stairway having its foot alongside of the front doorway, which is used only as an exit. The stairway for ascending passengers is, in consequence, on the opposite side of the car from the door, which is used as an entrance, and the fare box, behind which the conductor is stationed, is located near the foot of this stairway, as shown in the accompanying illustration. This arrangement provides a loading space having a length of approximately three-quarters of the width of the car and gives room for about eight entering passengers between the door and the fare box.

The seats on the upper deck are longitudinal and are arranged back to back in the center of the car the same as in the original car, the space underneath the seats providing a clear headroom for the first floor of 6 ft. ½ in. In the new design, however, these seats are curved outward at the ends of the car so that headroom for the motorman on the lower deck is provided across the full width of each end. In consequence the motorman can stand erect on the lower deck when operating the car without having his movements restricted, as on the original car, to a space equal in width to the aisle between the first-floor seats.

The over-all length of the new car is 47 ft. 2 in. and the width is 7 ft. 10 in., both dimensions being approximately standard with the newer single-deck cars of the Pittsburgh Railways. This makes the new cars shorter but wider than the original, which was built in the railway company's shop by fastening two small cars end to end and putting a second deck over them. The trucks are set on 22-ft. 2-in. centers and each end of the car is in consequence almost exactly balanced over one of the trucks. The over-all height is 13 ft. 8 in., 9 in. less than that of the original, and the clear heights for the upper and lower decks are respectively 6 ft. and 6 ft. ½ in. The headroom at the central wall is approximately 6 ft. 3 in.

The center part of the roof is made 4 in. higher than at the ends, since at the middle section of the car which is occupied by the well it is necessary to have a clear headroom of at least 6 ft. over the full width of the car for

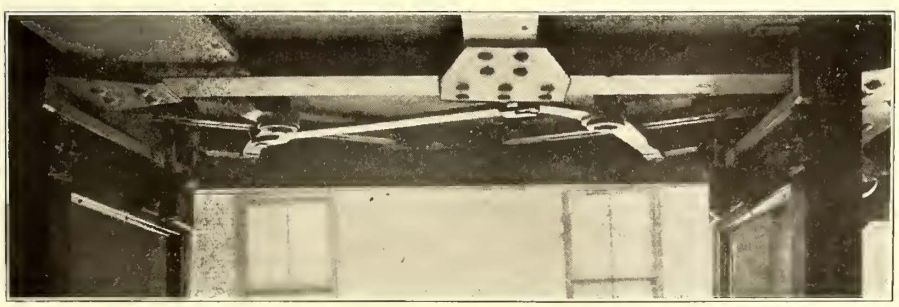
both decks. Except at the central well, however, this is not necessary as the clear headroom has to be maintained only in the aisles, and at the sides of the upper deck the floor is depressed 4½ in. to form a walking space in front of the longitudinal upper-deck seats. The depressed ends of the roof have been provided in order to permit the trolley pole to swing out over the edge of the roof on a curve under a low bridge and also to permit the installation of roof ventilators without adding to the over-all height of the car. These ventilators are less than 4 in. high and they do not extend above the level of the center part of the roof. They are installed instead of a forced-draft ventilating system because the experience obtained with the original car has indicated that they will be sufficient even in winter weather when the car is completely inclosed.

Pittsburgh Double-Deck Cars—View Showing Controller Under Stationary End-Seat with Extended Shaft for Operating Handle

Pittsburgh Double-Deck Cars—View at Rear End Showing Controller and Brake Handles Removed to Provide Room for Seated Passengers

Practically the whole side of the car is designed to act as a beam and the entire weight of the car is transmitted to this, no underframing being used outside of the two center sills for transmitting pushing and pulling strains. The portion of the car siding which carries out this beam action extends up to the window sills on the second floor, the siding between the upper and lower windows being made up of 3/32-in. plate with a 3-in. x ⅜-in. bar at the top and a ⅜-in. x 4-in. bar at the bottom to serve as reinforcement. This section of the siding is tied into the siding on the lower deck by the side posts, which are made of two steel plates on either side of a 3-in. channel iron and a wooden spacer. The lower section of the siding is formed by 3/32-in. plate, reinforced by a ⅜-in. x 3-in. bar at the top or just beneath the window sills on the first floor and reinforced at the bottom by a 3-in. x ⅜-in. angle which takes the place of the side sill.

The body bolsters which transmit the load from the sides to the truck center plates are made up of pressed shapes to form a box girder, the diaphragms at the top and bottom being made of ¼-in. plate and ½-in. plate respectively and having a width of 15 in. The center sills, which serve only as a means to absorb pushing and pulling strains, are made up of two 4-in. channels set with the flanges vertical. At a point on either side of each bolster these two channels diverge, extending at a 45-deg. angle to the ends of the bolsters to take up any tendency of the frame to rack. In the center portion of the car where they are again brought parallel and close together they are bent downward under the central well and assist in supporting its floor. Floor beams, of course, complete the framing.



Pittsburgh Double-Deck Cars—Door Operating Mechanism and View Showing Guides for Bottom of Door

SEATING ARRANGEMENT

The seats on the lower deck are in general transverse, and as previously mentioned those on the upper deck are set longitudinally to provide headroom in the aisles for the first story, thus following the same principle used with the original design. Additional seats are, however, provided wherever space for them exists, so that on the lower deck two semi-circular seats for five passengers each are provided at either end of the car and four single seats are placed next to the well. Four longitudinal folding seats are provided in the center well, of which two, seating two persons each, are located opposite the doors on the blind side of the car. The other two, one alongside each stairway, seat three passengers each, but only one of these seats is used at one time. The semi-circular end seats at the extreme ends of the car are stationary and the one which is at the rear of the car is used to seat passengers, the one at the front being used for a space for the controller and brake handles as described later.

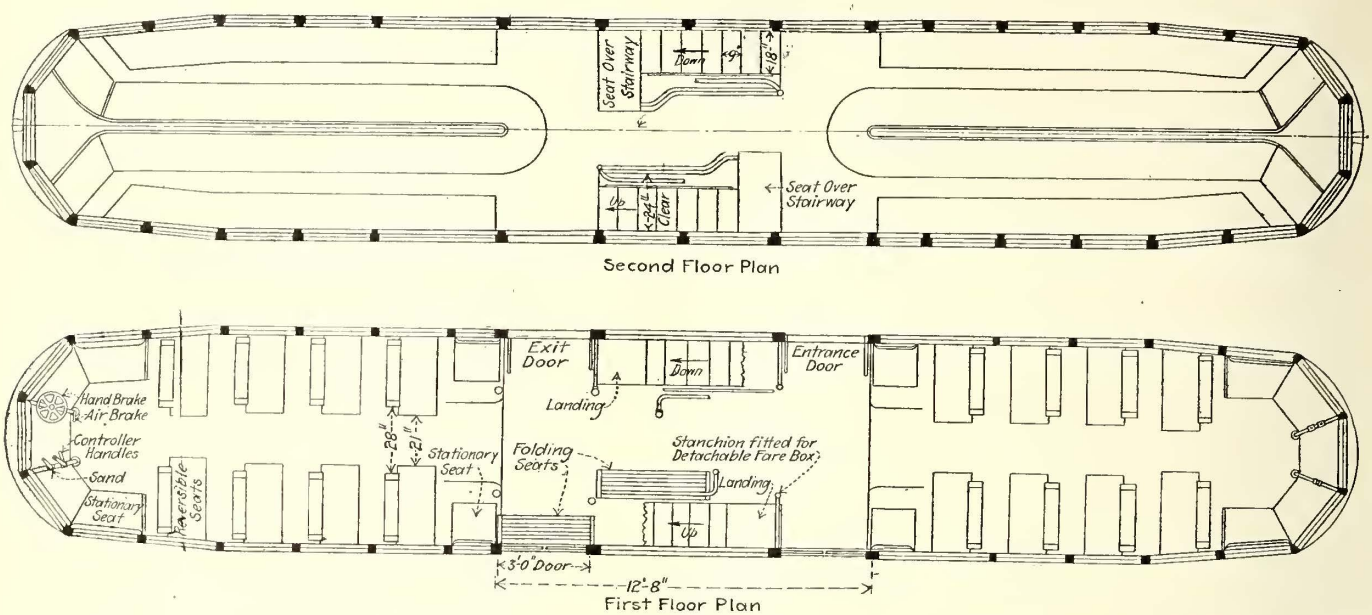
On the upper deck, in addition to the longitudinal seats, there are two transverse seats, each seating two persons, at the ends of the stair wells. These, together with the longitudinal seats, provide a seating capacity of fifty-six persons for the upper deck, and as the lower deck will accommodate fifty-four passengers, the total seating capacity of the car is 110. The weight of the car completely equipped is 38,700 lb., giving the unprecedented figure of 352 lb. per seat.

ENTRANCE AND EXIT FACILITIES

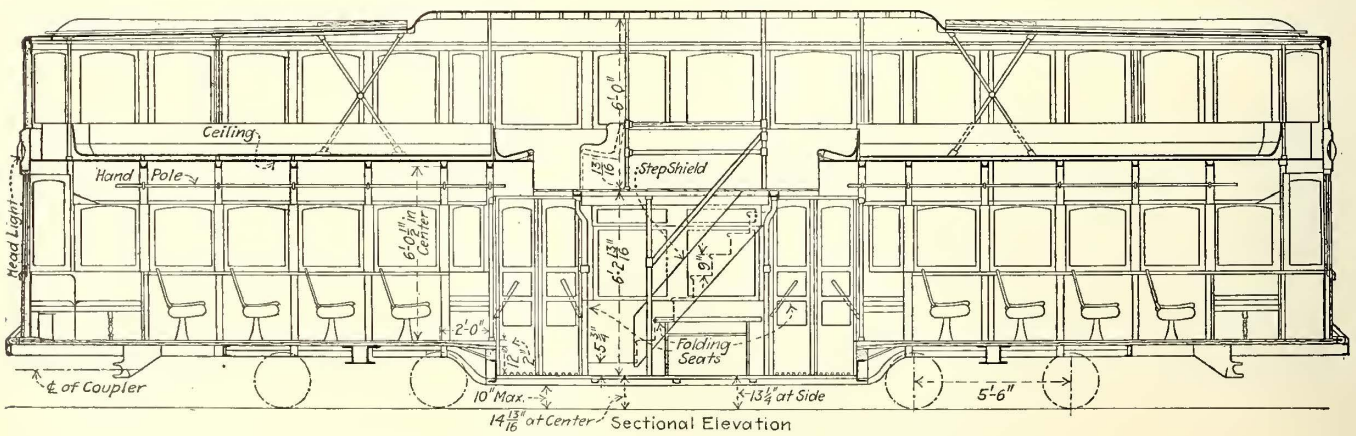
The feature of two widely separated doors, of which one is used for an entrance and the other is used for an exit, as developed in the original Pittsburgh double-deck car, is retained in the new design. The separation of the two doors by a distance of approximately 7 ft. has been found to be very effective in separating incoming and outgoing crowds of people and accounts to a considerable extent for the rapidity with which passengers have been handled in the trials, some of which were reported in the issue of Sept. 14, 1912, page 414.

One of the schemes for avoiding delay in unloading passengers from the upper deck is the elimination of the usual push buttons from that floor. There is, however, a push button at the head of the exit stairs, and signs are prominently displayed to call attention to its location. Upper-deck passengers are, therefore, required to be ready to descend the exit stairs before they can signal the car to stop and, as both the motorman and conductor control the exit door and see the feet of any descending passenger, the chance of carrying anyone past his destination is limited.

The depressed portion of the lower deck which forms the center well reduces the height of the step from the ground into the car to 13¼ in. From the doorways there is a slight slope upward to the center line of the car amounting to about 1½ in. and formed by gradually increasing the thickness of the floor strips, a safety tread being provided at the edge of the step. From the wall to the main floor



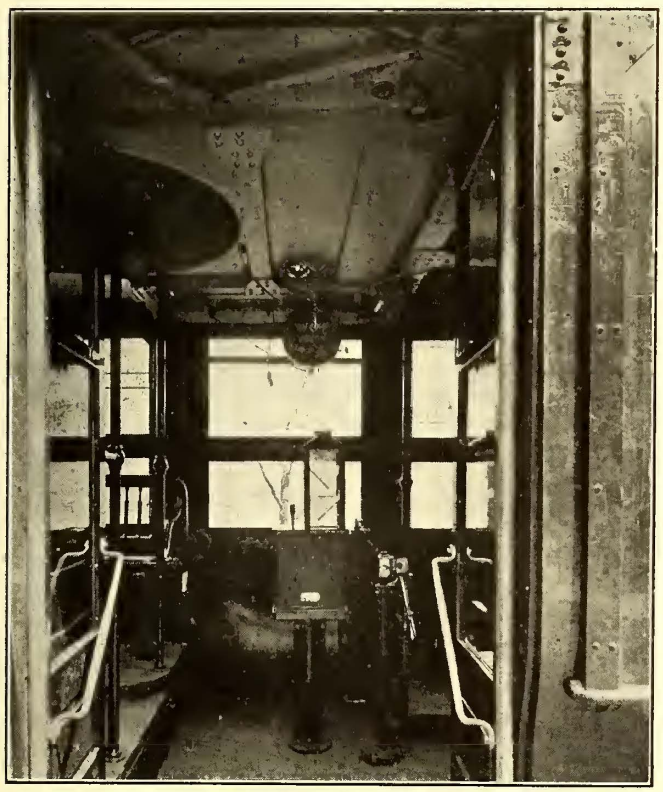
Pittsburgh Double-Deck Cars—Plans of Upper and Lower Decks



Pittsburgh Double-Deck Cars—Cross-Sectional Elevation

of the lower deck there is a step of 12 in. and a short ramp 2 ft. long gives an additional rise of 2 in., bringing the main floor to a height of 28¾ in. above the rail. Access to the upper deck is effected by a series of eight 9-in. steps which start from a small landing 5¾ in. above the floor of the well. These stairs are restricted in width to 18 in. in order to prevent any possibility of double lines of passengers either ascending or descending, as the fact that the stairs are used only in one direction obviates any necessity for crowding or the passing of passengers while on them. Passengers thus have an opportunity to use hand-holds on both sides of the stairs if the necessity arises, and this minimizes any tendency toward an increase in the number of interior accidents due to the presence of the stairs.

The doors are pneumatically operated by the system which has been made standard in Pittsburgh except that owing to the restricted headroom the apparatus has been reduced in size so that the mechanism takes up no more space than the channels which support the floor. With this device each doorway is provided with two doors, each one

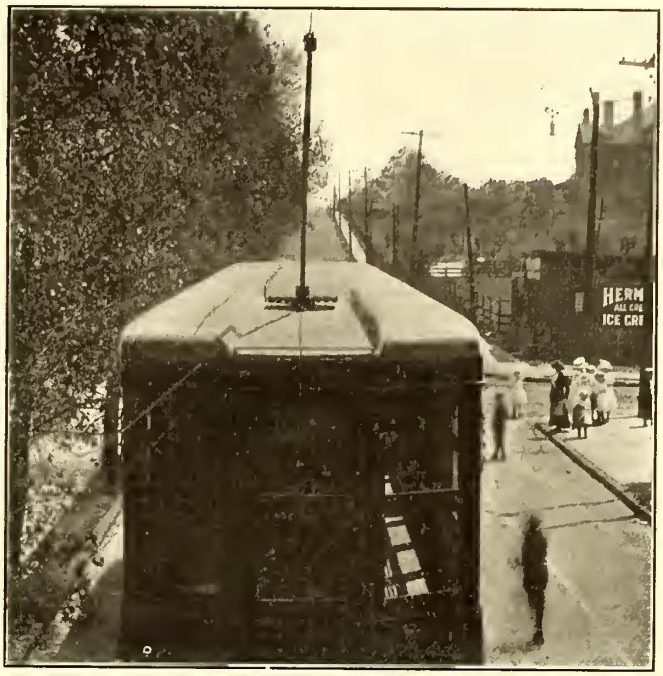


Pittsburgh Double-Deck Cars—Entrance Doorway and Fare Box

of which is equipped with roller supports and guides to define its movement. At the side of the door near the doorpost there is a pin sliding in a guide extending straight inward from the doorpost so that the outer edge of the door is compelled to travel straight in and out. At a point about one-third of the width of the door from the other edge is another pin which slides in a straight groove, making an angle of about 30 deg. with the plane of the doorway, and this compels this edge of the door to travel across the doorway as would a sliding door. The result of the combined movement of both ends is to make the door as a whole slide into open position around a sharp curve, taking its open position at right angles to the doorway and in line with the doorpost. The two doors in each doorway are mutually operated by means of a simple bell-crank arrangement as shown in the illustration on page 959.

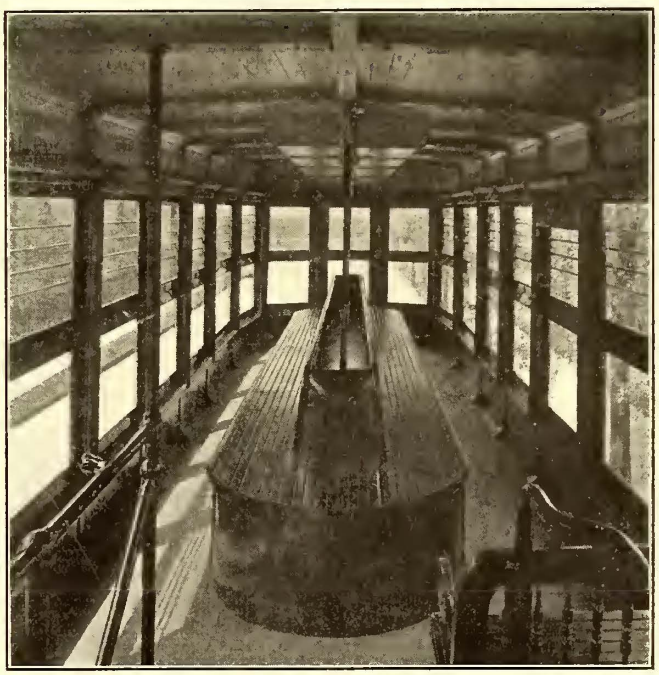
EQUIPMENT

The car is equipped with "low-floor" type of truck with 24-in. wheels and small motors, as described in the ELECTRIC RAILWAY JOURNAL for Aug. 3, 1912, page 154. Four of these motors are used, and for their operation a novel form of control has been developed. The master controller used with this equipment is so small that it is placed under the



Pittsburgh Double-Deck Cars—View Showing Trolley Harp Mounted in Depression in Roof

semi-circular end seat which is located at each end of the car. An illustration on page 959 shows the arrangement of controller and brake handles on the original type of double-deck car, and from this it will be seen that passengers are able to sit immediately over the controller so that no seats need be lost on account of its existence at the



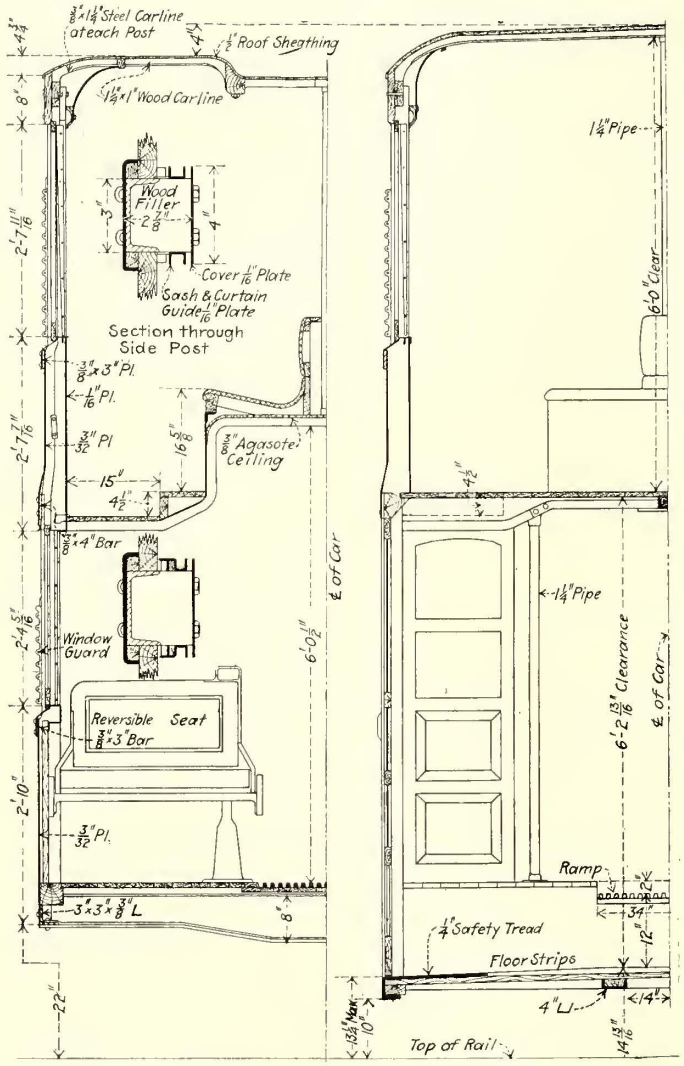
Pittsburgh Double-Deck Cars—Interior View of Upper Deck Showing Depression in Roof for Trolley Harp

rear end of the car. When the controller handle and brake handle are removed from their shafts, as shown in the other illustration, no space is occupied outside of the vertical partitions, which are installed on the end seats and

which really serve as spacers to prevent any passenger from occupying more than a fair share of the seat.

It is reported that a number of tests of the new control have been made during the past three months, and these have shown that it saves an average of 10 per cent in the consumption of current compared with the standard resistance types. No resistance is used except at the first control point, and it has even been found that the car could be operated without resistance at all except for the fact that after the gears are somewhat worn the absence of resistance at the time when all motors are thrown on to the line in series causes the car to jerk. The resistance has been added to provide for back-lash in worn gears. A detailed description of this new device will be given in a later issue of the Electric Railway Journal.

Another novel feature of the car is the provision for



Pittsburgh Double-Deck Cars—Cross-Sections at End and at Center

keeping all parts of the trolley pole and harp below the high point of the roof, which enables the trolley to pass any overhead structures under which the car itself will go. This is effected by mounting the trolley harp and pole in a depression along the center line of the roof which extends from a point slightly ahead of each truck center to the ends of the car. As this depression follows the center line and is only 2 ft. 6 in. wide, it does not decrease the headroom except within a space extending over the longitudinal seats of the upper deck. At this point, of course, no necessity exists for full headroom because the passengers have no chance to stand upright when they are under it and thus cannot strike their heads against it.

WORK OF THE SIGNAL DEPARTMENT

At a meeting of the Central Railway Club on May 9, a paper was presented by B. H. Mann, signal engineer Missouri Pacific Railroad, giving an outline of the work covered by railroad signal departments. An abstract of the paper is given herewith.

The signal force of a railroad generally takes care of apparatus as follows: interlocking plants, which are defined as assemblages of switches, locks and signals, so interlocked as to guard against the setting up of conflicting routes; manually controlled signals, and automatic electric block signals, each signal responding automatically by means of electric or other power, controlled through electric track circuits actuated by a train or other conditions affecting the use of a block.

The signal department also has charge of highway crossing gates operated either mechanically, electrically or by pneumatic power and highway crossing indicators which give visible or audible warning to users of the highway of the approach of a train. The supervision of hand lanterns, fusees and other signaling apparatus by the signal department is of quite recent origin, and careful, expert attention has not always been given to this equipment. The service of the fusee must be carefully followed up and both the ignition and burning efficiency tested. In a recent development test for ignition, types of fuses were immersed in water for a minute and then allowed to stand several minutes in pouring rain, after which an attempt was made to ignite them. One type showed but little effect from its mistreatment, but a large per cent of another type failed in ignition. Such an emergency signal must be fit for use in all kinds of weather.

In the beginning of signaling there were electrical inspectors, mechanical inspectors, mechanical repairmen, electrical repairmen, fitters, wiremen, blacksmiths, battery men, carpenters, painters and lampmen. Possibly there might be ten men in one small territory. With the growth of the art, one by one the various specialists were combined, until now, except for a general overhauling of any sort, customarily all the work of repairs is performed on any section by one man.

The usefulness of the self-confident, all-around repairman consists largely in the repair of the faults before they cause annoyance, the anticipation of causes of failures, or the quick return to service of a unit accidentally put out of working order. Except where the traffic is very dense and fast a repairman can reach any part of a 15-mile district in about an hour by velocipede or motor car. To be on the spot quickly after an accident is of great advantage both in the prevention of unnecessary damage to apparatus and in checking the working conditions.

The relatively low mileage assigned to each man in signal maintenance work and brought about by the combination duties developed makes for quick repair of apparatus out of order and for a minimum number of trains passing the apparatus while out of order, thus providing a relatively high efficiency. This does not include installations where, owing to highly important traffic, a continuous service of repairmen is maintained for the entire twenty-four hours.

On a lightly signaled division the repair force may spend as much as six hours in travel for every hour of work. Where this is the case there is an incentive to provide other duties for the signal force, so as to reduce to as great an extent as practicable the waste time on the road. This has been done by assigning to the signal men all miscellaneous blacksmith work on the division and all light repairs such as window glass setting and odd painting. A crew of three men under this assignment would regularly start at one end of the division and by moving forward a few miles daily would keep up all light repairs on track tools, switches, switch stands, frogs, crossings, buildings and signals, with but very little time spent in travel.

Convention of the Southwestern Electrical & Gas Association

At the Annual Meeting Held at Galveston, Tex., May 21-24, Papers Were Presented on a Number of Subjects of Interest to Electric Railways, Among Which Were Lightning Protection, Small Oil Engines, Boiler-Feed Water, Car Design and Standard Accounting Systems

The annual convention of the Southwestern Electrical & Gas Association was held at Galveston, Tex., on May 21-24, 1913. A number of papers were presented which were of special interest to electric railways and these are given in part in the following paragraphs.

PROTECTION OF HIGH-TENSION CIRCUITS AND APPARATUS

This subject was treated by E. E. Nelson, electrical engineer Northern Texas Traction Company, in a very complete paper, dealing with the present methods of insulating and arranging high-tension conductors and apparatus both within the power house and on transmission lines. With reference to lightning protection Mr. Nelson said that the trouble with insulators breaking from lightning surges increased with the voltage, but the trouble with the apparatus was more severe on moderate-voltage lines of from 5000 to 15,000 volts. For the protection of lines under 2500 volts lightning arresters should preferably be distributed out along the line, but for higher voltage they were needed at the apparatus only. The best type of high-tension lightning arrester on the market was, he said, the aluminum-plate electrolytic arrester, consisting of a number of aluminum trays placed one within the other, separated by small spaces, the trays being filled with an electrolyte and the whole placed in a tank filled with insulating oil. This had the peculiar and very important characteristic that a film which formed on the aluminum plates had a high resistance until, by high voltage, it was broken down by numerous small punctures making almost a short-circuit for the high voltage, but as soon as the voltage stress was removed the minute punctures sealed up and the arrester recovered its original high resistance. For voltages less than 13,000 non-arcing cylinders were used on the line side of this device. For higher voltages the horn gap was used. There was also required a fuse which would blow if the film on the aluminum plates did not recover its high normal resistance.

This arrester could be placed outdoors or indoors, but it had been found in Texas, during the extreme heat, that when placed in the sun it gave considerable trouble. In some cases it had been necessary to place shades over them and to paint the containing tanks white to keep them from absorbing too much heat. It was necessary to cause the arrester to work by bringing the gaps close enough together to enable the normal voltage of the line to jump across and operate the arrester about once in twenty-four hours.

To supply the demand for an inexpensive arrester for the protection of small transformers on the high-tension lines, where the revenue would not justify the expenditure for the best possible arrester, there had been recently developed a compression chamber type consisting of a number of metallic gaps inside of a porcelain tube connected to the line through a resistance rod inside of the same porcelain tube.

With ungrounded neutral, lightning arresters should be rated at the voltage between the wires. With grounded neutral, it was sufficient to use an arrester rated about 20 per cent higher than the maximum voltage between the line and the ground.

For protection against the breakage of line insulators, overhead ground wires and a metallic lightning rod at each pole, 5 ft. or 7 ft. above the highest insulator, had been found to give material protection. The best protection would be furnished by grounding these rods at each pole by a conductor running down the pole, but it was usual practice to ground the rods on wooden pole lines about every five or six poles.

OIL ENGINES FOR SMALL POWER PLANTS

A. L. Chase, secretary-treasurer Clarendon Light & Power Company, described in his paper a steam-driven electric-light plant of 150 hp capacity in which the fuel bill had been reduced from $225 per month to $164 per month by the substitution of two-cylinder, vertical, low-compression, make-and-break ignition oil engines. Texas Company No. 2 Solar oil was used, costing 4 cents per gallon delivered.

During the year 1912 the service was out for about four hours on account of trouble at the station. Very little trouble was had in starting the engines and the regulation was equal to that of any high-speed automatic cut-off steam engine. Few repairs were made and the only accident which occurred was due to neglect on the part of the engineer and was not the fault of the engine.

WATER FOR STEAM BOILERS

The subject of boiler-feed water was treated by A. C. Scott, Dallas, Tex., in a paper which described the various waters of the Southwest with regard to the material which they held in solution and in suspension. He also cited the common methods of reducing trouble from scale, saying that the hot-process system was particularly desirable for boiler plants where exhaust steam was available for heating the water, the whole scheme being virtually embraced in the ordinary operation of a feed-water heater with the introduction of soda ash into the hot water. Live-steam purifiers were useful as partial purifiers, but they were always subject to boiler pressure, wasted some heat, had to be placed higher than the boiler level and frequently gave trouble from water hammer.

Boiler compounds were more or less palliative in their action, and if composed for the most part of non-humbug constituents, would produce results by combining with the scale-forming impurities, breaking them up, precipitating scale-forming matter and entrapping it as it was precipitated from solution before it had formed a hard, adherent scale. Such compounds were recommended for use only in small plants whose capacity would scarcely justify arrangements to purify the water before it entered the boiler. If possible, the steam boiler should not be used as a "precipitation tank," but if it was, the feed water should be analyzed and the character and amount of the necessary chemical reagents determined. These should be pumped into the boiler with the feed water in the form of a solution made up of definite strength, the amount pumped in being proportioned to the operating conditions of the boiler.

The blowing-off process was important, but it should be done under low pressure. Undoubtedly some of the troubles that were recorded as due to scale-forming water were really attributable to the disregard of proper methods of blowing off and to the pumping in of cold water, thereby overstraining the boiler material. The use of kerosene oil as a remedy for scale trouble had many advocates. To be reasonably effective in any case the kerosene should be put in after the boiler is emptied and washed, and the refilling of the boiler should be done slowly from the bottom.

Boiler troubles due to foaming or priming apparently depended to a large extent upon the concentration of alkali salts in the water within the boiler, although the factors of silt, organic matter, loosened scale and lubricating oil all

had an appreciable bearing upon this phenomenon. Surface blowing was, of course, a remedy where it could be applied, and in the majority of cases the proper use of the main blow-off would be a help.

CAR DESIGN

C. O. Birney, superintendent car construction Stone & Webster Engineering Corporation, said that specifications for city or suburban cars should be complete in every detail, leaving no chances for arguments between the contractor and the purchaser and should not be changed after contract was let. The purchaser should have a competent inspector empowered to act and should back him up in every way. The inspector should be in the drafting room when drawings were made, as he could thus save the car builder money, get a better car and eliminate many delays.

In the past, when many of the horse car lines were changed into electric lines, the old horse car bodies were changed over to accommodate the new conditions, and these in most cases proved to be too light and fragile to withstand the additional equipment and increase in speed. The operators after this experience wanted to be sure that the next cars they ordered would be strong and heavy enough to hold up, not taking into consideration the cost of power, wear upon track, special work and roadbed, caused by the increase in weight, as is done to-day, The contractors were willing to make the car heavy, as materials were cheaper than skilled labor, and as a consequence cars were being operated in the country that had enough material in them for two cars of the same dimensions, if properly designed and constructed.

In planning a car of to-day Mr. Birney said that designers studied climatic conditions and effects and made all cars for each section of the country as much alike as conditions would permit. They drew up complete detail specifications and thoroughly inspected all material and workmanship, insisting upon the car being built as specified. On account of present-day construction it was necessary to have the best material that the market affords, and the workmanship had to be first-class in every respect, requiring high-class and high-priced mechanics. Purchasers paid more for cars to-day on account of this and on account of the cost of safety devices and arrangements for the comfort of passengers. Cars were designed so that they would have the least possible weight in order to hold up and have a low maintenance cost, as the designers figured that they saved 5 cents per pound per year in power cost by so doing, and also that the lighter car was easier on the roadbed.

On the trucks, Mr. Birney said, all ordinary wearing parts should be applied so that they could be taken out and replaced with a minimum expenditure of labor and without having to take the body off the trucks or disconnect the electrical equipment. All holes that had any chance to elongate should have case-hardened bushings. Friction between truck and body center plates should be reduced as much as possible in order to save power, track and special work. Truck and body side-bearings should be not less than 3/16 in. apart. The body-bearing plates should be turned up at end to prevent them from passing under the truck-bearing plate when a car splits a switch. The distance from center to center of journals on a city truck of 4 ft. 8½-in. gage should be not more than 71 in., for it was reasonable to believe that the closer the bearing point was to the hub of the wheel, the stronger would be both journal and axle, and the shorter the distance over truck side frames the lighter the truck would be.

The hand brakes should be first class and kept in a working condition at all times. All holes in levers, both in air and hand brakes, should have case-hardened bushings and case-hardened key bolts.

Mr. Birney concluded with a brief specification to cover a car suitable for the Southwest, which included for a single-truck car seating thirty-two passengers a total weight with equipment not to exceed 24,000 lb. A double-truck car seating forty passengers, with two-motor equipment and straight-air brakes, should have a total weight not to exceed 31,000 lb.

STANDARD ACCOUNTING SYSTEM FOR SMALL AND MEDIUM-SIZED PUBLIC UTILITIES

A paper on this subject was read by H. E. Gordon, president Public Accountants' Society of Texas. He said that the system of accounts of any company should show first what a company owed and what was owing to it. After that it should show whether the company was making or losing money and, if the latter, when and where the money was lost. A good accounting system should be installed by every public utility company, whether such a system is required by the authorities or not. Many public utility properties have been sold by their owners at too low a price because the owners did not know the value of their property. The arguments for a standard system are, first, economy; second, convenience and, third, fairness of comparison. In the writer's opinion proportionally too little attention is given to the operating accounts compared with the property and security accounts. Mr. Gordon also emphasized the importance of elasticity in a standard classification to permit amplification when the system is applied to a large plant and yet keep it adaptable for the smaller plants. He believed that through the appointment of public utility commissions all public utilities would soon be required to establish standard systems of accounts. The speaker then defined some of the main accounts.

PUBLIC SERVICE RATES

A paper on this subject by William J. Norton briefly reviewed the bases used in the establishment of rates by different commissions. He said that while intangible values had formerly not been recognized by all authorities there had been a strong tendency to give more careful consideration to them within the last two years. Rate determinations are not necessarily dependent upon valuations, and none of those issued in the past by the Interstate Commerce Commission had been based upon valuations. Even if a valuation was made and used, the work of establishing the rate naturally divided itself into: (1) determination of the value for rate-making purposes, (2) determination of the rate of return profitable to the public utility concerned, (3) rate classifications and schedule of rates. Electric light and power cannot be considered as much of a "necessity" as either water or gas, hence an electric light and power company often had many development expenses in securing customers not required by a water or gas utility. Moreover, electrical energy cannot be stored like water and gas, and this increased the investment required. The writer believed that the electric light regulations of the various commissions showed a strong tendency on their part to encourage a high physical standard in the properties under their jurisdiction.

STANDARD ACCOUNTS FOR THE SMALL PLANT

A paper contributed by a "small-plant man" and written in an entertaining style described a classification which he used. It was simple and gave him all the information which he needed except that of a comparison of his accounts with those of other companies. He admitted this to be a serious defect and believed that a standard classification was desirable if it was not too expensive to conduct.

PROPOSED TYPE OF CONCRETE TRACK CONSTRUCTION

W. M. Archibald, superintendent of maintenance of way Houston Electric Company, described a system of concrete track construction now being considered in Houston. None has yet been laid. The conditions as to drainage and pavements and the character of the soil along the Texas coast makes concrete sub-construction desirable, and an effort was made to secure a design in which the rail could be renewed without great disturbance to the concrete foundation. Steel ties are used on 4-ft. centers. These ties are not punched with round holes for the bolts holding the rail clips. Instead, these bolts are passed through slots in the upper flanges of the steel tie and are held in place during

construction by a ⅛-in. slotted steel strap over which the rail clip fits. Hence, when the rail is removed or replaced, it is necessary only to excavate for a few cubic inches of concrete around each bolt head. The bolts can then be slipped out. The rail clip is of the usual form. The concrete, which is 12 in. deep, is carried flush with the top of the steel tie, and the rail is braced midway between every tie by a rail brace. For initial construction of concrete track under this cross-section, Mr. Archibald says, the trench should be first excavated to grade and after the rail is laid and spiked to the ties, the anchor bolts and brace plates should be attached and tightened and the entire steel structure blocked to line and surface. The concrete should then be cast in a monolith around the ties, anchors, etc. Mr. Archibald uses a layer of ½-in. sand above the concrete but omits the usual layer underneath the paving brick. Instead, the paving brick is laid on a bed of 1:4 mortar.

TRAFFIC CHARTS

P. L. King, auditor San Antonio Traction Company, described a system of charts compiled by his company to show the actual loading of cars on different days. At first full-day charts were made for as many lines as was possible for one man to prepare. This plan was found too slow, and the company now prepares charts for the rush hours only for every day on all lines but a full-day chart for Saturday and Sunday for at least one line and occasional full-day charts during the week. One man only is required to do this charting. A saving has been made in operating expenses by these charts. They are plotted on cross-section paper with time as abscissas and passengers as ordinates. Where a line passes through the center of the city the conductor, after reaching a certain point, makes a note on his trip sheet of the number of fares registered. This gives the number of passengers "in," and when this figure is deducted from the total fares registered the number of fares on the second half of the trip is determined.

DISCUSSION

An account of the proceedings of the Galveston convention will be published next week.

GAS-ELECTRIC AND STORAGE BATTERY CARS

The fifth annual convention of the International Railway Fuel Association was held in Chicago on May 21, 22, 23 and 24. Among the six papers presented at the convention was that on "Self-Propelled Railway Passenger Cars," by S. T. Dodd and B. H. Arnold, which was abstracted on page 934 of the ELECTRIC RAILWAY JOURNAL for May 24.

The reliability of gas-electric cars was brought up in the discussion. Messrs. Buell, of the Union Pacific Railroad, and Hilton, of the Frisco system, practically removed all doubt on this score by their accounts of the service rendered on their roads. The only trouble which had been experienced with motor cars had been caused by the ignorance of the operators. Educational bureaus have overcome this difficulty to a marked degree.

F. E. Drake gave some interesting figures on gasoline-electric motor-car performance in Hungary, Europe, and in Oklahoma. On the Arad-Csanad Railroad in Hungary seventy-two trains are operated in both directions daily. The average car mileage per year is 1,000,000 miles and total annual mileage is 5,300,000 car miles, which, according to Mr. Drake, is considerably more than any steam locomotives in the United States are capable of. In Oklahoma the motor cars on the Muskogee Electric Traction Company's road operate 3.3 miles per gallon of fuel oil. Operating expenses and fixed charges amount to 16.4 cents per car mile.

In a written communication from J. H. Tracy, some data were given on the performance of storage battery cars as compiled from actual practice. The author asserted that gasoline or gasoline-electric cars offer the best solution to the problem of handling light, infrequent traffic when conditions call for long-distance hauls at relatively high speeds and with few stops, and that the storage battery car "has a useful and economical field for service which is within the scope of the battery." One hundred miles per charge at a free running speed of 30 miles per hour, with an equipment seating seventy passengers and providing a suitable baggage compartment, seemed to be entirely within the range of conservative operation.

The Lewisburg, Milton & Watsontown Passenger Railway Company in Pennsylvania had been operating since early last October a storage-battery car built by The J. G. Brill Company and equipped with an "Exide" lead battery from the operation of which data had been compiled. The car in operation on this line is 34 ft. 4 in. over the corner posts, has a seating capacity for thirty-two passengers in the passenger compartment and has a baggage room 11.5 ft. long. It is of standard construction, and while carefully designed for light weight, embodies no special features except that ball bearings are used to reduce the running friction. The car weighs 32,200 lb. complete with battery, the battery weighing somewhat less than 8000 lb. Between Oct. 9, 1912, and April 1, 1913, it ran more than 20,000 miles, regularly performing approximately 122 miles a day. During this time the car lost only 19 miles from the full schedule. This loss was due to a damaged charging plug which in turn damaged the car wiring. The entire care of this car, including charging the battery, cleaning, inspecting, etc., is assumed by two crews, each consisting of one motorman and one conductor.

During the six months of operation mentioned above, which it will be noted covers the winter months, the consumption of this car averaged approximately 4.25 amp-hr. per car mile. The battery equipment consists of eighty-eight cells having a rating of 420 amp-hr., the individual cells being identical with those which have been used successfully since September, 1910, on the Third Avenue Railway, New York. The battery averages 170 volts during discharge in this service, which gives an energy consumption of 722 watt-hr. per car mile. Assuming an average live load of 1.5 tons, the actual energy consumed from the battery amounts to 41 watt-hr. per gross ton mile. The ruling grade on this line is 0.7 per cent, there being a difference of 88 ft. in level between the two termini. The number of stops averages between one and one and one-half per mile, as the car is stopped at intersecting roads as well as at the regular passenger stations of the Pennsylvania Railroad Company. As the rating of the battery is 420 amp-hr. and the energy consumed in driving the car averages 4.25 amp-hr. per car mile, the mileage capacity on one charge of the battery is nearly 100 miles.

BERLIN ELECTRIFICATION MEASURE IN PRUSSIAN DIET

During April the lower house of the Prussian Diet passed by 192 votes to 143 a bill which will empower the government to make at a cost of $6,125,000 preparations for the electrification of the Berlin Stadtbahn, with certain temporary restrictions. The Prussian Minister of Public Works, Herr von Breitenbach, said that electrification would be $1,500,000 cheaper a year than steam. With electricity it would be possible to run forty trains an hour instead of twenty-four, and to increase accommodation for passengers by possibly as much as 100 per cent. The steam service would not be altogether abolished, but he regretted that opposition to the scheme had originated with manufacturers of steam locomotives. A representative of the War Office said the Ministry of War had no objections to the electrification of the railway. Very little use could in any case be made of the old steam engines in mobilization, because they were not adapted for heavy military loads.

RECENT PASSENGER STATIONS IN LOS ANGELES

The Pacific Electric Railway, of Los Angeles, has recently adopted the Mission style of architecture for its passenger stations, a style which is of course very appropriate for the region through which its lines operate. In all the company has about twelve standard types of stations, but the accompanying engravings of a modified Mission type "A" architecture will give a very good idea of the present practice of the company in this style of station. A very interesting feature of the plan followed is that these stations are arranged so that if the traffic increases and more room is required a station can be easily changed from one size to a larger one, and yet a symmetrical floor plan and architectural treatment are retained.

In the accompanying illustrations Figs. 1 and 3 show the front and end elevations of the Van Nuys station and Fig. 2 shows its plan. The accompanying halftones show end and front views of the station respectively.

The chimney is of brick. There is a tile roof supported on wooden rafters. The interior finish is in Oregon pine, and redwood is used for the exterior finish.

The foundations, walls, columns, etc., are of concrete in the proportion of one part of Portland cement, two parts of sand and four parts of crushed rock or screened gravel of size varying from ¼ in. to 2½ in.

The flooring of the waiting room and offices is of Oregon pine, that of the freight room of pine with the rough side up, and that of the toilet rooms of cement. The ceilings in the passenger portion are plastered.

Should the traffic grow, the station shown in Figs. 1, 2 and 3 may be extended to make the Mission type "A" station shown in Figs. 4 and 5. In this case the waiting room and offices remain the same, but the freight room is lengthened and a large open platform with a roof is built adjoining the closed freight room.

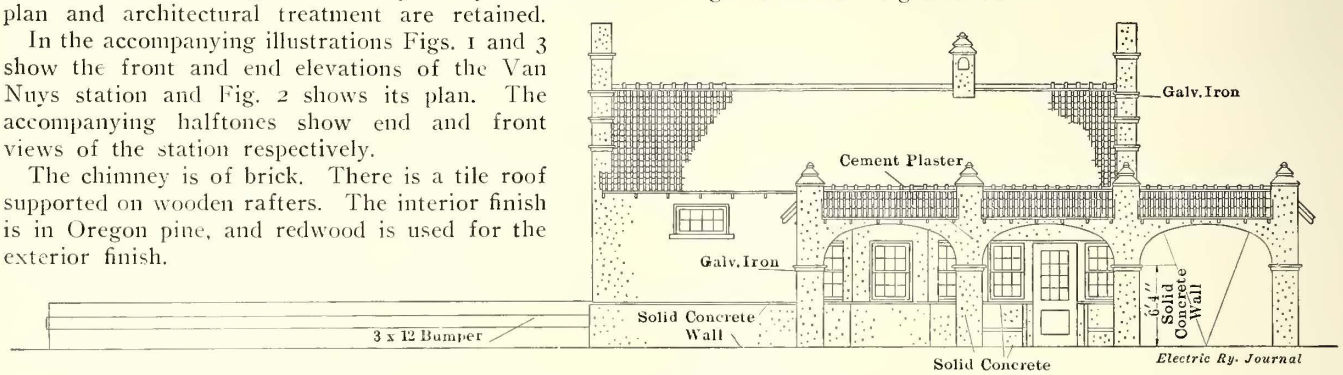


Fig. 1—Los Angeles Stations—Front Elevation of Van Nuys Station

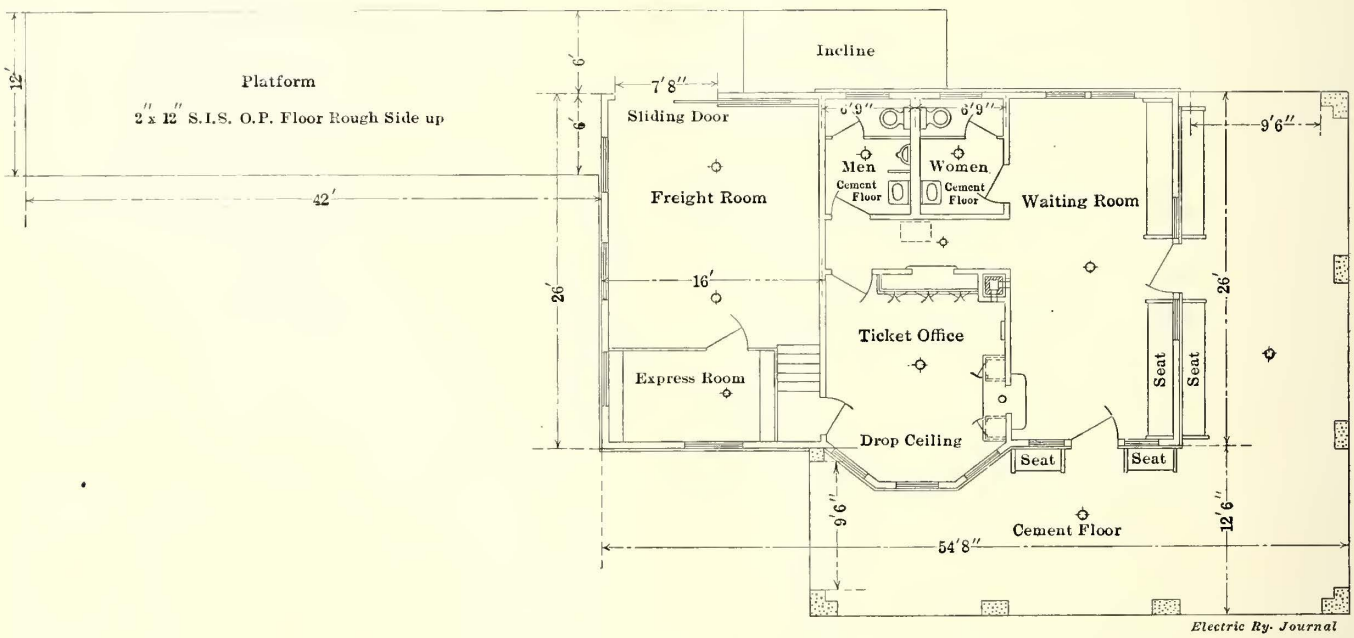


Fig. 2—Los Angeles Stations—Plan of Van Nuys Station

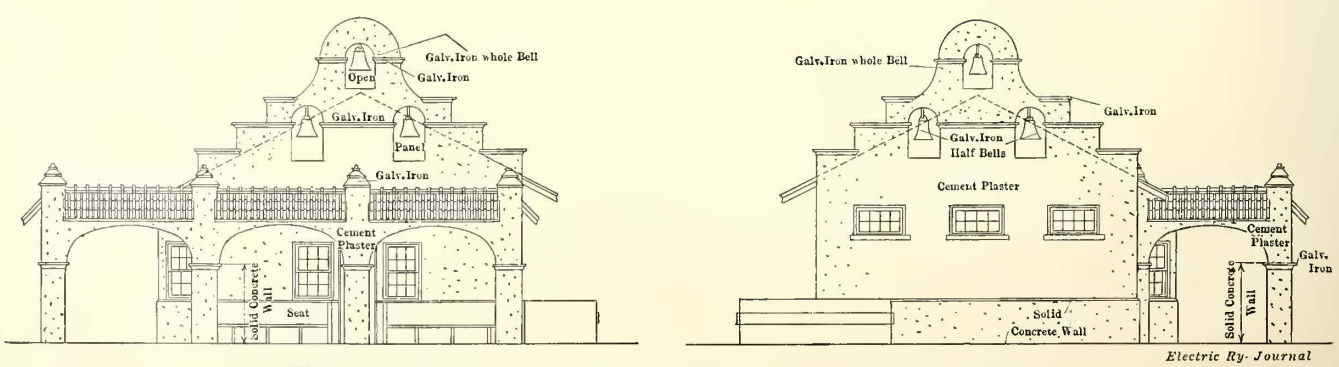
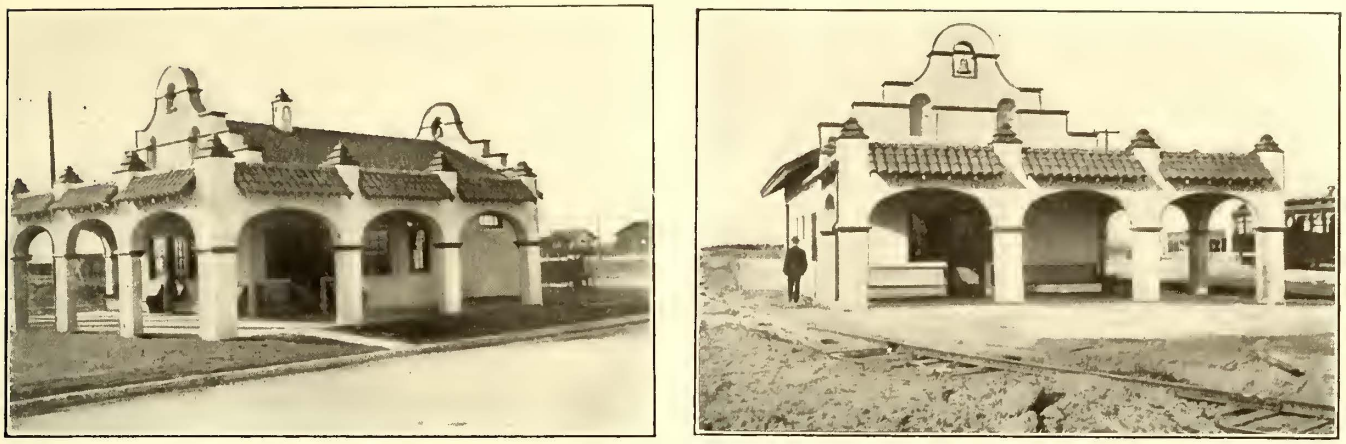


Fig. 3—Los Angeles Stations—End Elevations of Van Nuys Station



Los Angeles Stations—Front and Side Views of Van Nuys Station

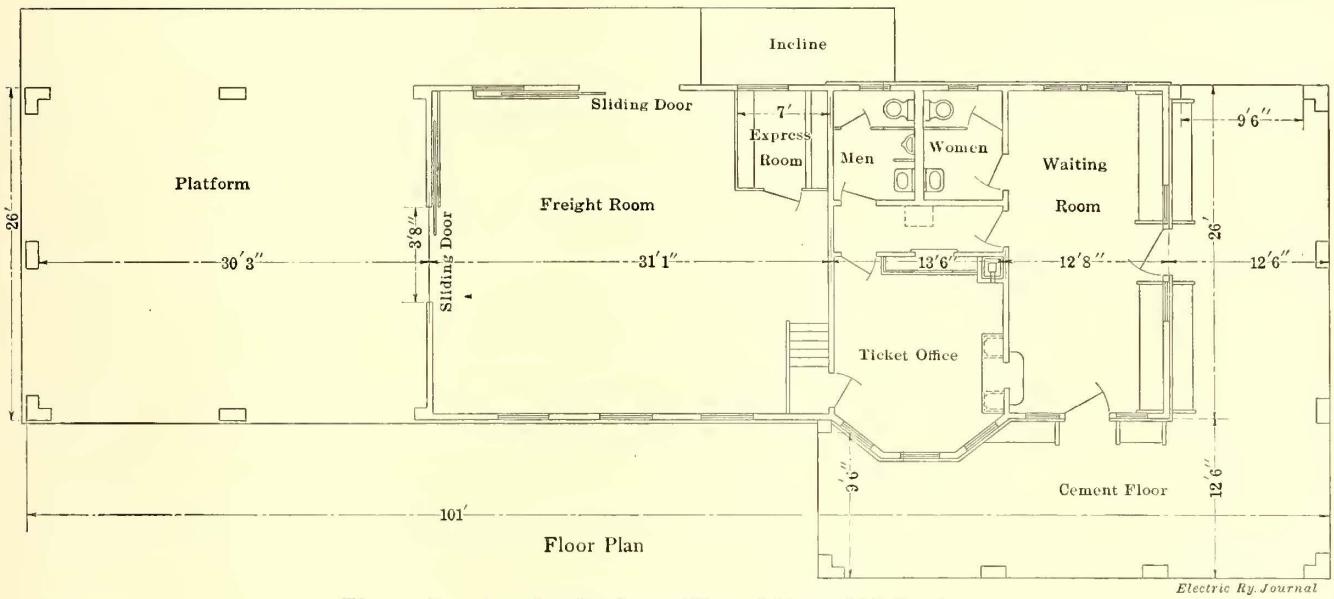


Fig. 4—Los Angeles Stations—Plan of Type "A" Station

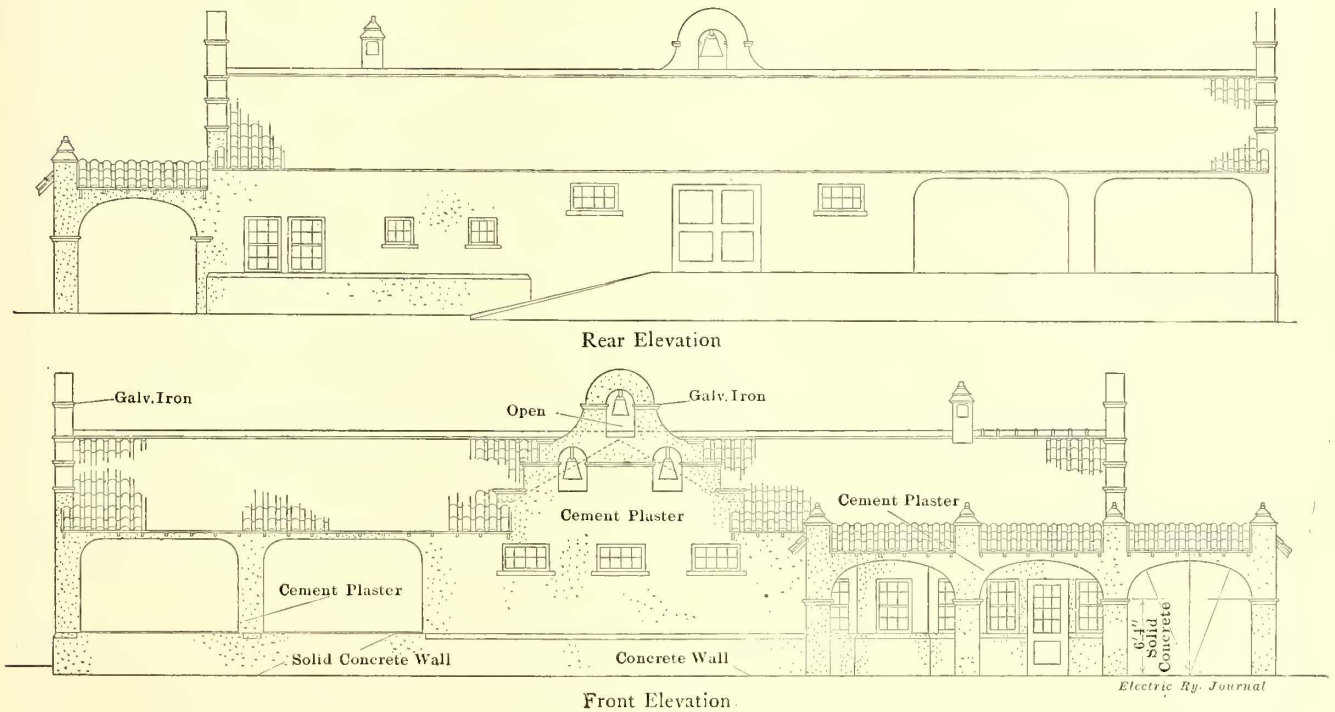


Fig. 5—Los Angeles Stations—Elevations of Type "A" Stations

Report on Toronto Conditions

Unified Management Is Strongly Recommended—Estimates Are Published of Future Traffic and the Equipment Required for It—A Subway and Motor Buses Are Considered

The report of Bion J. Arnold on traction improvement and development of the Toronto metropolitan district, made recently to G. R. Geary, K. C., corporation counsel of the city of Toronto, contains a number of recommendations relating to service and proposed construction.

In his letter transmitting the report Mr. Arnold says in part:

"The increasing demands and the opportunities for further traction development have been shown, and the necessity of a comprehensive plan for rehabilitation, betterments, extensions, re-routing and publicity has been, in my opinion, fully demonstrated. Two plans are submitted, one contemplating the operation of all lines in the Toronto district under one management, and the other providing an independent system with an entrance to the heart of the business district for many of the present and proposed civic lines, with the system so planned that it can eventually be co-ordinated with the lines of the present traction system when the franchises under which they are now being operated expire."

Section I of the report takes up Toronto conditions and is in part as follows:

"In some respects the service in Toronto is better than in many other cities, and the present deficiencies may be largely overcome by proper co-operative measures on the part of the city and the company, if the policy is such as to make this possible. Car congestion may be remedied by the re-routing of a few lines in the congested district, and overcrowding at certain rush-hour periods could be largely eliminated by the addition of a few cars on the trunk lines. Revised time-schedules based upon faster operation would greatly improve the service without the addition of a car to the present equipment. This may be greatly aided by a more careful training tending to produce alertness on the part of the conductors and motormen, and thereby inducing more activity on the part of the public when boarding cars and alighting from them.

"Cross-town lines in certain sections are needed for the proper transportation of passengers to and from their homes, and extensions to existing lines should be built into outlying territory. Subways have been advocated as a means of relief for present congestion. With the transportation affairs of the city under unified management subways would not be warranted at present. Subways should be looked upon in the nature of a last resort, a necessity forced by conditions for which there is no other remedy. Toronto does not at present need subways nearly so much as it needs more surface tracks and more and better and faster surface cars, preferably under unified management.

"Since 1907 the population of the city has increased over 45 per cent, according to official police records, or an average of 9 per cent per year. During that period car track mileage was increased from 101 miles to 113 miles, about 12 per cent, or 2.4 per cent per year. Car miles operated were 42,036 per day in July, 1909, and 43,878 per day in July, 1911, an increase of but 4.5 per cent in two years, or 2.25 per cent per year, plainly demonstrating that the track mileage and service have not kept pace with the increase of the population. During the period 1907-1911, inclusive, the gross income increased 38.2 per cent, or an average of 9.6 per cent per year.

"The Toronto system earned $1,661,017 in 1901 and $4,851,541 in 1911. Assuming this rate to be continuous, an increase of business of 192 per cent must be provided for in 1921, with estimated total gross earnings of approximately $14,000,000 per annum at that time. These figures may seem to be excessive, but at the present time over $12 per capita per annum is being used for street car transportation by the people of Toronto, and the city is growing quite rapidly. A general rule used frequently in estimating probable increases in city transportation earnings is that 'within reasonable limits the annual transportation income of any large center of population increases approximately as the square of the increase of population.' Applying this rule to the city of Toronto on the basis of 390,000 estimated population in 1911, with an annual increase to 1921 of 6 per cent and the expenditure in 1911 of $12.40 per capita for transportation, the estimate for earnings in 1921 does not appear to be too large. During the past decade the actual rate of increase of earnings has fallen below this law of the square of increase in population in spite of the growth of the city.

"Ordinarily for a system covering an entire city, under conditions similar to those herein outlined for Toronto, about 70 per cent of the income is required to operate and provide for taxes and depreciation. From the Toronto Railway Company's annual reports of 1911 these items, exclusive of renewals, consumed but 57.46 per cent of the gross income, demonstrating an ability on the part of the company to increase its service materially without sacrificing a fair return from the business, even if a liberal allowance is set aside for renewals.

Table I—Statistics of Population and Receipts of Ten Cities

	Miles Track per 1,000 Persons	Receipts per Capita	Receipts per Mile of Track	Population per Mile of Track
Washington	0.656	$19.18	$29,258	1,525
New Orleans	0.590	12.41	21,030	1,695
Baltimore	0.716	13.75	19.220	1,397
Cincinnati	0.610	13.72	22,540	1,640
Cleveland	0.437	10.93	24,990	2.286
Toledo	0.690	11.90	17,241	1,448
Seattle	0.790	15.44	19,470	1,261
Milwaukee	0.388	10.13	26,114	2.579
Toronto	0.289	12.44	42,929	3,451

"From the annual report for 1911 made by the company to the Ontario Railroad Board the total expenditure of the company for maintenance only is found to be 8.58 per cent of the gross receipts, a figure which compares favorably with that of the average of all the Chicago companies for 1910, i.e., 8.6 per cent, but the comparison is not so favorable when the amounts spent on maintenance of track and roadway alone are compared, i.e., 0.926 per cent for Toronto and 2.27 per cent for Chicago. An examination of the property shows that about 35 per cent of the tracks should be rebuilt and other improvements made. After the entire property is put in good physical condition there should be expended annually upon maintenance and renewals, in order to keep it in first-class operating condition, from 15 to 18 per cent of the gross receipts, depending upon the growth in earning capacity of the property.

"The power for the supervision of the maintenance of the physical property, as well as its operation, should be vested in a provincial or municipal board, clear of political bias and of unquestioned integrity and professional skill, and this board should be empowered by such legislation as is necessary to enfore its mandates fully."

Section II, dealing with present traffic conditions, is in part as follows:

"In order to handle the same amount of business other cities are provided with more cars and more tracks, the average for nine American cities being about one car for each 500 of population and one mile of track for each 1800 of population, or one mile of track for about $23,055 of re-

ceipts. Selecting several cities suitable for traction comparisons with Toronto, track mileage, population and receipts and their ratios are found to be as shown in Table I."

Sections III and IV outline recommended additions to existing lines and a plan whereby the construction of the necessary track work, part of which is already finished, could be completed in five years. Section V states that the construction of the trackage recommended would increase the mileage from the present 113 miles to 240 miles at the end of five years.

CAR AND SERVICE REQUIREMENTS

Section VI describes car and service requirements and estimates "that the transportation system outlined in the report, when completed, will require 1100 cars for the transportation of a population of 718,000 in 1921. With 500 of the present cars retained in service on light lines of travel or rebuilt, there will be required 150 new cars to replace trailers and the poorer class of single-truck motors. As fast as new lines are added to the system and population increases, new cars will be needed, the estimate being 250 for this purpose at the end of five years. The rest of the final requirements should be placed in service at the rate of fifty per annum."

The report suggests the reconstruction of the city cars of Toronto by additions to lengthen the platforms and by changes in the seating arrangement. In reviewing types of cars developed recently, the report says regarding the near-side car:

"While it has certain advantages, especially where used in conjunction with the near-side stop, it is a single-ended car requiring terminal loops and has not as great storage capacity on the platforms as the type of pay-as-you-enter car illustrated in the report. It therefore may, like the center-entrance car, be considered in the experimental stage."

CARHOUSES

Regarding carhouses Section VII says that "the present locations of carhouses in Toronto are quite convenient for the distribution of cars over the lines as they are. Generally speaking, no carhouse should be so constructed as to allow of more than twenty-five or thirty cars being subject to loss by fire at any one time, and all structures of this class should be as nearly fireproof as possible."

A plan is presented for a modern carhouse with a repair and storeroom bay and six storage bays containing three tracks each, with a total capacity of 191 cars inside the building and room for twenty-five cars on the special work at the ends of the buildings, which could be used for temporary storage. The report adds: "A carhouse according to these plans was constructed recently, in which inspection pits were provided under 59.5 per cent of the total tracks in the storage bays and under 76.6 per cent of the total trackage in the repair bay. Modern carhouse practice provides for fireproof construction and double-end operation, with the structure divided into bays or sections, and with reinforced concrete slab roofs. Carhouses of this character should be built, for the accommodation of 250 cars, for about $410,000, or $1,600 per car."

The total cost of the proposed additions to the present Toronto transportation system for 127 miles of new track (the city furnishing the roadbed and paving), 600 modern prepayment cars, additional carhouses, substations and other equipment necessary, would be in the neighborhood of $8,762,000, divided approximately as follows in Section VIII of the report:

"Track construction, 127 miles of single track (3.5 miles grooved rail; 123.5 miles T-rail), $2,127,000; overhead wires, poles and cables, $489,000; carhouses, $820,000; cars, $4,500,000; power stations and equipment, $726,000; miscellaneous equipment (work cars, snow and ice machinery, line wagons, sprinklers, etc.), $100,000; total, $8,762,000. An additional expense would be incurred should it be desired to place electrical feeder and return cables underground. Under Toronto conditions the cost of these ought not to exceed the following: manholes, $98; iron pipe laterals, 60 cents per foot; conduits, 41.6 cents for two ducts up to 10.17 cents for forty-eight ducts, per duct foot."

The report says on the subject of probable earnings:

"Presuming the completion of the proposed additions by the close of 1917, the financial showing for the year 1918 for the entire system of 240 miles of track in the Toronto district is estimated to be as follows: Gross earnings, $10,800,000; operating expenses, taxes, renewals, pavement charges, etc., at 70 per cent, $7,560,000; net earnings, $3,420,000.

"The above estimate is considered very conservative for the following reasons: (1) The earnings are based upon the present riding habit, which averages $12.40 for the city, as it is now covered by the present limited traction lines. Were the complete system considered by this report to be now in operation, there would unquestionably result a higher earning per capita. (2) Owing to the possibility of very cheap power being available for the operation of the entire system, an operating ratio as high as 70 per cent is probably the maximum (including pavement charges). With such power supply the actual operating ratio will probably be in the neighborhood of 65 per cent (exclusive of pavement charges). The minimum net earnings that would be expected, $3,420,000, capitalized at 5 per cent, would support an investment of $64,800,000, or, capitalized at 8 per cent, approximately $40,000,000. These figures may be assumed correct on the theory of a continuing investment on the part of the municipality or a company, but they should be reduced by whatever amount is found necessary to amortize the investment within the franchise life if the property is developed and operated by a company under a franchise for a fixed period."

Detailed suggestions for the re-routing of lines are made in Section IX.

ALTERNATIVE PLAN

Section X outlines an alternative plan in a subway terminal in the business center and is in part as follows:

"Should it be considered desirable or necessary for the transportation system of Toronto to be operated under more than one management for the next nine years, the greatest need for the new lines will be a terminal in the business center of the city; this provided, construction of the necessary service and development lines could follow as rapidly as desired and circumstances would warrant. The success of the civic undertakings in Gerrard Street, Danforth Avenue and St. Clair Avenue will depend largely on the answer to this question. Without proper outlets such isolated lines generally lead a precarious existence and in many ways prove a disappointment.

"Subways have their uses in congested areas where surface terminals are insufficient for traffic needs and where elevated structures would be objectionable. For the support of subways there should be densely populated districts some distance from the business center seeking rapid transit which other means of transportation are unable to provide. The subways of New York and Boston were not constructed until after all other classes of transportation had reached their limit of carrying capacity. Under these conditions only will a subway, as a subway, pay its way. As an inlet for an extended system of surface lines serving a large territory the governing reasons for the adoption of a subway change to such an extent that its construction is occasionally warranted."

Costs of a city terminal subway, surface lines, etc., are estimated in the report as in Table II.

"The financial success of this undertaking would depend entirely on the rapidity with which the territory to be served increased in population. At present the traffic to be had would not warrant the expenditure, but the guarantee of rapid transit within a short time should at-

tract settlement at such a rapid rate as to double the population north of St. Clair and Danforth Avenues by the time the subway was completed. For quite a number of years after that time the increase should be from 12 to 15 per cent per annum, as many persons would move from less favored districts to the zone which is supplied with rapid transit.

"The population at present in the territory tributary to the proposed surface lines is estimated at 60,000, about 37,000 of which could be counted on for patronage for a

Table II—Costs of Subway, Etc.

Double-track subway in Yonge Street	$4,328,000
Single-track subway loop	496,000
Danforth Avenue branch (Yonge to Broadview)	1,338,000
Carrying charges on terminal system (7½ per cent during construction, 2½ per cent per year)	462,000
Double-track surface lines (17 miles)	1,490,000
Single-track surface lines (10 miles)	472,000
Pay-as-you-enter steel cars (150 at $8,500)	1,275,000
Carhouses	320,000
Substations and equipment	242,000
Miscellaneous—work cars, line wagons, snow, ice and sprinkler equipment	50,000
Total	$10,473,000

subway system. With this doubled, by the time the downtown terminals were completed, there would be a population of 74,000 of probable patrons, which, at $12.40 per capita per annum, the rate Toronto is now paying (which would be a low rate for this outlying territory), would give an estimated income from passenger receipts for 1917 (if the completed system, costing $10,473,000, were operated) of $917,000. It is probable that the receipts per capita per annum would run from $15 to $18 for this outlying territory, as it is not within walking distance from the business district. Assuming this rate to average $16, the gross receipts from passenger service would be $1,184,000. Adding $20,000 for advertising and news-stand privileges, the gross receipts for the first year of operation would be $1,204,000. Allowing 62 per cent for operating expenses, including maintenance, during the first year of operation, there should remain $457,520 to meet fixed charges, renewals, taxes and amortization, if the latter is deemed advisable."

An estimate of cost for part of the system is also given in the report.

MOTOR BUSES

The subject of motor buses and radial lines is taken up in detail in Section XI, which says in part:

"The use of motor buses from the nearest terminals of the civic lines to the business center has been suggested to cover the period between the completion of a surface line and the completion of the subway. This is not thought advisable. The motor bus can be profitably operated only in the districts where traffic is continuously heavy, on short hauls from one congested center to another, or by charging much more than the regular street car fare. Toronto conditions do not seem to warrant an experiment of this character.

"Reports from different cities where motor buses are being used do not offer much encouragement for engaging in the business under Toronto conditions. When competing with existing electric lines results have not been satisfactory, even when a higher fare has been charged. The principal difficulty seems to be on account of the large depreciation necessary on buses (generally 33 1-3 per cent) and the heavy tire renewal charges. In a certain Western city it was found necessary to double the fare to 10 cents per passenger on a route less than a mile long between two congested passenger centers, where transportation conditions were quite favorable. A gross business of $20 per day per bus was considered necessary to pay all charges, including interest on investment. The buses cost $4,500 each, averaged 50 miles per day, seated sixteen passengers and cost 36 cents per car mile to operate. The average daily receipts per bus were $14.22. The driver acted also as fare collector. A bus seating twenty-five passengers could be procured for $6,000, but the expense of a fare collector would be added."

A recent published analysis of the financial results of the New York bus lines gives the rate of speed at 7.2 miles per hour; average passenger capacity of buses, thirty-five; tire expense, $2.21 per day per bus; cars in regular service, fifty-four; total necessary to maintain the service, eighty; tire cost for the year for eighty cars, $844.55 per car; annual depreciation on buses, 33 1-3 per cent, and passenger fares at 10 cents. For the year 1911, on a gross business of about $500,000, a deficit of $38,000 was reported.

CARHOUSE PLANNING BY THE UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE

The United Railways & Electric Company of Baltimore is notable as the first large electric railway in the United States to adopt a distinctive style of architecture in which graceful outlines have been combined with ample natural lighting, cleanliness, freedom from fire, durability and operating convenience. As the attainment of these ends demands the combined services of the operating man, car and way engineer and artist, the following statement from an official of the company, describing the way in which the company and its architects co-operate in the work of designing and erecting carhouses, will undoubtedly be of interest to other electric railways:

"In the first instance a track layout is prepared by the railway company indicating in a general manner the office accommodations. This plan is carefully gone over by the various departmental heads interested until all are unanimous in the opinion that it economically and advantageously meets the company's requirements. The architect is then requested to submit a sketch showing a design of the proposed carhouse, which is gone over in conference by the interested railway officials with the architect until a thorough understanding of the requirements of each is reached. The architect then prepares the final design on which he indicates the partition walls, the dimensions in each instance being noted, as it is very necessary to show the various column locations in their precise position. Simultaneously, while these matters are being handled by the architect, a large track work plan is prepared by the engineering department of the company on the same scale as that of the architect, in order to assure, when the two schemes are under consideration, proper clearances and other requirements.

"Specifications are then prepared by the architect, and, after they have been submitted to and approved by the officials of the company, requests for bids are sent to a number of responsible contractors.

"The bids are opened in the executive offices under the direction of President William A. House, after which they are tabulated. A thorough study is then made of the plans by the architects, operating officials and engineers with a view to effecting further economies if possible. Upon receipt in the executive offices of the joint report of those officials, the contract is awarded to the lowest responsible bidder, and the erection of the structure is proceeded with under the general supervision of this company.

"It has not been the company's practice to have the architect incorporate in the specifications the installation of either the sprinkler system or the furnishing and erection of the tank which provides the supply for the gravity operation of the sprinkler system. On the other hand, it has been its aim to have the company's forces handle direct as much work as possible, with a view to reducing to a minimum the amount on which the fees of the architect are based. The ordering and installation of all track and overhead work is handled direct by the executive and engineering departments of the company, and the architect receives no compensation therefor."

The Cleveland Hearing

L. P. Crecelius Discusses the Depreciation of Power Stations and T. Scullin the Depreciation of Rolling Stock—Other Testimony Presented by the Company at the Hearing Last Week

The hearing being conducted in Cleveland by an arbitration board to settle differences between the Cleveland Railway Company and the city in regard to allowances for maintenance, renewals and depreciation and for other operating expenses was adjourned on Wednesday of this week until June 3. An account of the early part of the hearing was published last week. On May 21, after the conclusion of the testimony of Henry C. Davies, reported last week, A. C. Ernst, of Ernst & Ernst, certified public accountants, was called and was examined by Andrew Squire, of Squire, Sanders & Dempsey, counsel for the company.

TESTIMONY OF MR. ERNST

Mr. Ernst said that his firm was first employed in the fall of 1908 by the creditors' committee, which sought information regarding the financial affairs of the company. It was next employed, about Nov. 12, 1908, by Receivers Scott and Bicknell and served under the receivers, obtaining instructions from Judge Tayler regarding various accounting matters, up to March 1, 1910, when it was retained to represent the city under the then city street railroad commissioner, Mr. Dahl, serving in that capacity up to Jan. 1, 1912. The firm worked out the system of accounting which went into effect with the Tayler ordinance, advising with Mr. Dahl and the officers of the railway and following largely the system prescribed by the American Electric Railway Accountants' Association. The system adopted was practically identical with the one followed for the receivers.

Under the receivers a reserve was left for accidents and damages but none for fire insurance. The reserve for accidents was 0.7 cent per car mile up to April, 1909, and 0.8 cent per car mile up to April, 1910. It was found that 0.7 cent did not provide a sufficient reserve to take care of the claims that were being presented and paid, and on the basis of 0.8 cent per car mile there was a final over-expenditure of $42,000. This deficit included an estimate from the claim department that $22,000 would be required to clear up the suits pending, and there was an actual deficit of $20,000. These made the total of $42,000. On March 1, 1910, there was an apparent surplus of $52,000 in the accident fund, and that was accumulated largely under the 0.7-cent charge per car mile, but the receivers' claims were not coming in during the first year of the receivership because time was necessary to litigate these claims, so that the larger part of the payments came in the latter part of the receivership. When the books were opened for the commissioner the amount was continued at 0.8 cent.

Mr. Ernst also testified in regard to the practice of other companies whose reports showed the existence of reserve funds. He mentioned the injuries and damages reserve held by the United Railways of St. Louis on Dec. 31, 1911, when the amount stood at $200,000. The New York Public Service Commission, Second District, permitted reserves for casualties and insurance under the heading "optional reserves."

Testifying in reference to the car-mile allowance for maintenance, renewal and depreciation in Cleveland, Mr. Ernst said that during the time when he acted for the receivers and for Mr. Dahl, commissioner for the city, there was not a sufficient balance left after maintenance and renewal charges were met to provide any reserve for depreciation. Mr. Ernst defined "depreciation" as that expense which was occurring every day on property which could not be renewed or made good by maintenance or repairs. It was a gradual and slow deterioration of the property, and corporations provided for it by setting aside a specific amount out of earnings each year for that kind of a shrinkage in the assets. It was above repairs and maintenance. His criticism was that either the company was spending too much or the 5 cents per car mile was not ample, because, as the company went on, there was certain to be a time when a large amount of the property would be depreciated and would have to be charged off, and no fund was provided against that time.

Under the cross-examination of Mayor Baker Mr. Ernst said that the only way to find out whether 5 cents per car mile was enough, too much or too little was to find out whether by the expenditure of that amount the property was in the standard of condition prescribed by the ordinance, better than that or not so good.

Mr. Ernst was asked by Mr. Baker whether in his experience as an accountant he had ever known a case in which so large an item as $800,000 was written off in a single year for a single thing. Mr. Ernst replied that he knew of no instance where any company confronted with a large item of loss, say $800,000, had continued to carry that as an asset and write off a proportion of the amount each year. He had had one case where a company had an inadequate power supply and built a new power house and equipment. The old one was good only for auxiliary purposes and the company immediately wrote off practically all of the investment, carrying the equipment at its scrap value. This was done in one year, and it amounted to 7 per cent or 8 per cent of the entire capital of the enterprise.

Mr. Duffy said that the capital value established in the franchise was $24,000,000. On March 1, 1910, the $800,000 value of the power plants was 3⅓ per cent of $24,000,000. Mr. Duffy then asked Mr. Ernst if, in case he were a stockholder of the company, he would feel disturbed over the operating allowance, whether it was 11½ cents or not, and whether or not there was a reserve for accidents and insurance, so long as he felt that the integrity of the investment was preserved and that he would get the 6 per cent dividend.

The witness said he would feel very comfortable about his 6 per cent dividends, but he would want some assurance that the city was going to take the property at the end of the franchise.

Mr. Ernst defined surplus as that amount remaining of excess assets over all liabilities, either due, not due, accrued or contingent; that is to say, the balance remaining above the capital stock and all liabilities, whether funded or otherwise. In determining the surplus in the operating expenses he would provide for all labor costs, including the last half of the monthly payroll payable on the tenth day of the following month, all material and supply charges, all items of taxes and insurance, expenses of every kind, including an amount for accidents and damage claims, and the balance would be either a surplus or a deficit from operating.

The witness thought that if the railway was to be operated on the basis of good service and with joint control on the part of the city over expenditures and the method of accounting, if it appeared from honest bookkeeping methods that a deficit was being accumulated in the operating and maintenance funds, as a car rider he should say that the quicker the deficit was made good the better it would be. If the deficit was permitted to accumulate indefinitely it seemed to him that the point would be passed where it could be made up by a small increase in the fare. The

matter of the deficit was far more vital as a future proposition than it was as a temporary issue. He had had a wide experience in companies that did not provide for ample depreciation and had seen many companies where the stockholders were called upon to contribute in cash to a deficit. This deficit had not been a temporary matter. It was an accumulation from a series of years while the management was trying to make a showing, and all at once, after a number of years, everybody woke up, creditors and stockholders, and found that the property had depreciated to a very serious extent.

Table I—Statement of Maintenance and Operating Reserves as Reported by Treasurer Cleveland Railway

	Ten Months, 1910	1911	1912	Three Months, 1913	Thirty-seven Months
Maintenance Reserve:					
Allowance	$1,142,919.39	$1,390,079.90	$1,438,662.29	$280,230.92	$4,251,892.50
Expenses	1,369,897.65	1,506,651.71	1,387,427.47	337,378.09	4,601,354.92
Surplus or deficit	* $226,978.26	* $116,571.81	$51,234.82	*$57,147.17	*$349,462.42
Operating Reserve:					
Allowance	$2,561,207.11	$3,423,634.40	$3,347,558.13	$805,663.91	$10,138,063.55
Expenses	2,598,477.58	3,389,317.81	3,548,146.67	888,955.80	10,424,897.86
Surplus or deficit	*$37,270.47	$34,316.59	*$200,588.54	*$83,291.89	*$286,834.31
Maintenance and Operating Reserves:					
Allowances	$3,704,126.50	$4,813,714.30	$4,786,220.42	$1,085,694.83	$14,389,956.05
Expenses	3,968,375.23	4,895,969.52	4,935,574.14	1,226,337.89	15,026,252.78
Deficit	$264,248.73	$82,255.22	$149,353.72	$140,439.06	$636,296.73

*Deficit.

L. P. Crecelius on the power situation

Lawrence P. Crecelius, superintendent of motive power of the Cleveland Railway, testified that his connection with the property began in June, 1907, when he entered the employ of the Municipal Traction Company. Mr. Squire asked Mr. Crecelius the effect upon the power plants and machinery arising from the contract with the Cleveland Electric Illuminating Company for power.

Mr. Baker objected to this question. Judge Killits ruled that the witness might state the result on the property of the company after the contract was entered into, saying that if this was a step toward establishing the claim of the company that these plants had nothing but scrap value, the witness might proceed.

Mr. Crecelius said that the plants were rendered absolutely useless. The Canal Road plant was shut down last November. Most of the machinery in question at the hearing was shut down at the Cedar Avenue plant about a month ago. The machines at the Viaduct plant were to be shut down on May 26. The Division Avenue plant would also go out of service on May 26. The Canal Road power plant was sold for $4,500; it was absolutely scrap. Much of the machinery in the Cedar Avenue plant would have to be handled in the same way, having only scrap value. A little of the machinery would bring a credit to this account, for it still had a little more than scrap value. The apparatus at the Viaduct plant was probably a little better than scrap. The Cedar Avenue battery plant was entirely scrap. The capital value these plants represented in the Tayler valuation was upward of $400,000. It was necessary to change because the equipment and its general arrangement and character were inadequate for the growing system.

The equipment of the power plants was not in as good condition as when the property was taken over, March 1, 1910. The overhead lines were not much improved, if any. The return circuit was still very inadequate for its requirements, although it had been improved to some extent.

At the session on May 22 Mr. Crecelius gave Mr. Baker a copy of a letter which he sent to John J. Stanley, president of the company, on Jan. 30, 1913. The letter gave a list and values of power plant equipment which was rendered obsolete on account of the power contract. There were five items, and the total at which they were valued in the Goff-Johnson valuation—that is to say, the value at which the property was included in the capital value of the company—was $463,129. The total reproduction value, the value at which the company contended it had the right to charge it off out of depreciation in one year, was $802,604.

During the cross-examination conducted by Mayor Baker Mr. Crecelius said that neither of the main important boiler rooms was in as good shape now as when they were taken over from the Cleveland Electric Railway. This was due to wear and tear and other causes. Some of the depreciation in a plant could be taken care of by renewals or replacements, but the life of the equipment could not be extended indefinitely in this way. In reply to another question he said that the value of all the property of the company, used and usable, in the divisions under his control was greater than on March 1, 1910, on account of additions and betterments which had been made, but that excluding these betterments the property was not in so good condition as it was on the earlier date.

The cost of producing power at the Canal Road plant just before it was abandoned was around 1½ cents a kw-hr., whereas, power could be produced for 0.5 cent per kw-hr. with up-to-date equipment. The price paid the Illuminating company was about 0.75 cent per kw-hr. delivered to the substation. The additional cost of delivery to the trolley wire was about 0.3 cent. The cost to the trolley wire from the Division Avenue station that the company proposed to abandon was about 0.9 cent. This figure did not include interest charges.

Mr. du Pont asked whether, as the company had its value in the plant, the car riders did not have to pay the major part of that 0.1 cent per kw-hr. more.

Mr. Crecelius said that on the contrary the car riders gained largely. The Division Avenue power plant was

Table II—Car-Mile Results of Operation of the Cleveland Railway, as Reported by the Treasurer

	Car Miles	Expenses	Expenses per Car Mile, Cents	Allowances	Allowances per Car Mile, Cents	Surplus	Wages of Motormen and Conductors per Car Mile, Cents
March 1, 1910, to Aug. 31, 1910	13,296,674	$1,514,543.24	11.39	$1,529,117.52	11.50	$14,574.28	6.07
Sept. 1, 1910, to Feb. 28, 1911	13,218,851	1,615,281.19	12.22	1,520,167.88	11.50	*95,113.31	6.65
March 1, 1911, to Aug. 31, 1911	14,392,783	1,711,666.73	11.89	1,754,317.10	12.19	42,650.37	6.66
Sept. 1, 1911, to Feb. 29, 1912	13,983,695	1,733,592.53	12.40	1,702,624.06	12.18	*30,968.47	6.75
March 1, 1912, to Feb. 28, 1913	29,170,344	3,545,324.98	12.15	3,354,589.58	11.50	*190,735.40	6.67
March, 1913	2,410,847	304,489.19	12.63	277,247.41	11.50	*27,241.78	6.41
Total	86,473,194	$10,424,897.86	12.06	$10,138,063.55	11.72	*$286,834.31	6.53

*Deficit.

located very close to the Viaduct plant, and its effectiveness was diminished by transmission of the power to the outlying districts. The price paid per kw-hr. for the current that was bought included all charges, and this current was delivered to the outskirts of the city where the company was ready to use it, which was not the case with the Division Avenue plant.

Mr. du Pont said he was not criticising the contract, but what he wanted to bring out was the fact that at the Division Avenue power plant or the Cedar Avenue power plant, or at any power house but the one at Canal Road, current could be produced at 500 volts or 600 volts at a lower rate than the contract provided. The witness said that was correct.

Judge Killits asked what the overhead charges, taxes, depreciation and other charges of that sort would aggregate per kilowatt-hour. The witness thought they would add 0.3 cent.

Mr. du Pont thought these charges would probably be more than that and would carry the total up to 1½ cents. with interest on the investment. He also thought the new system more reliable.

The question of obsolescence was brought up, and it was conceded on the records that the plants were obsolete.

TERANCE SCULLIN ON THE ROLLING STOCK

Terance Scullin, master mechanic of the Cleveland Railway, testified that he had been in the service of the company or its predecessors for over twenty-six years. He had been away for a year and one-half, but with that exception had been with the company continuously. Mr. Scullin testified that on March 1, 1910, the company had 973 cars, of which 820 were available for service. Excluding the betterments and additions which had been made, the cars were not in as good condition now as then. The company had now 1040 cars available for service. It was very difficult to determine the average life of a car. The progress of the art has been so fast that the cars would be changed and scrapped before the possible life could be determined. In fact, it seemed to be very hard to determine the life of any equipment in connection with traction properties. It was also impossible to prolong its life indefinitely by repairs.

Testifying in regard to the conversion of a car of a specified type for prepayment operation, Mr. Scullin said that the cost of conversion of a 30-ft. car was about $600, of which 25 per cent was charged against the maintenance fund and 75 per cent against capital. The witness said that including the money that was spent and charged to capital the condition of the cars was better to-day than it was in 1910. About 215 new cars had been added since March 1, 1910, and of this number twenty-five were motor cars and 190 trail cars. Arrangements had been made for more trail cars.

STATISTICS OF OPERATING RESULTS

Table I, published herewith, shows the maintenance and operating reserves, as compiled by Henry J. Davies, treasurer Cleveland Railway, from March 1, 1910, to March 31, 1913. Table II shows the results of operation, as reported by Mr. Davies, on a car-mile basis. These tables were presented by Mr. Davies during the early part of the sessions, reported in the last issue of this paper.

The next hearing is scheduled for June 3.

THURY MULTIPLE-UNIT SYSTEM

A new type of multiple-unit system, constructed under the Thury patents, has recently been placed on the market by H. Cuénod, of Geneva. It has been in trial operation for the past year on the Martigny & Chatelard Railway, near Chamonix. The ordinary controllers are used on each car, but by means of a synchronizing device these controllers are automatically operated and kept in synchronism by a master controller carried in the front cab of the first car. The synchronizing current used in the control system is obtained from a sixteen-cell storage battery. The master controller has a revolving cylinder and contact fingers, like an ordinary controller, and moves the several car controllers by means of small motors, of which there is one on the top of each car controller. This motor revolves the car controller to approximately the proper position required by the position of the master controller, and exact position is obtained by means of an interlocking tooth and gear. By a special attachment the controllers can be turned quickly from the series to the parallel position. Four wires are carried in the train cable, three for the work described and a fourth by which the circuit breakers can be opened from the cab in case of need

NEW ENGLAND STREET RAILWAY CLUB MEETING

Two hundred and twenty members and guests of the New England Street Railway Club assembled at the American House, Boston, on the evening of May 22 for the final meeting and banquet of the season, President Elton S. Wilde being in the chair. The topic of the evening was the "Training of Motormen," and the principal speaker was Howard W. Irwin, assistant superintendent of equipment Bay State Street Railway, Boston, Mass. Mr. Irwin pointed out that the position of a motorman on an elevated or surface road is anything but a sinecure in view of the responsibilities resting upon the man behind the controller, that the company has intrusted to his careful handling a piece of apparatus whose money value far exceeds the product of many years of his labor and whose safety and continued usefulness depend for the time almost wholly upon his skill and foresight, and that the conditions under which the work is done are varied and often difficult.

The speaker said that the methods pursued by some railway companies in selecting motormen would be ludicrous were not the situation one of so serious a nature. "Motormen made while you wait" seems to be the motto in such cases. The fact is that good general health and the ability to understand signals are sufficient qualifications for a motorman's position with a good many companies, and a training of from three to nine days is often considered sufficient. At the close of the probationary period the green man is supposed to be able to run his car in a safe and efficient manner, and it is assumed that he will rise to the occasion whenever the emergency turns up. The chances are that such a man knows how to start, stop or reverse under favorable circumstances, but just how much he will remember in case of a sudden emergency, or just how much trouble he will get into when any little thing goes wrong, can only be guessed at. His blunders go into the repair or claim department and come out as "necessary expenditures."

Inexperienced and inefficient service of this kind is of advantage to the company in no respect. The number of suits annually brought against city railways for damage to persons or property resulting from the ignorance of employees is so appallingly great as to make it necessary for each organization to have always in its employ a number of lawyers whose sole duty is to fight or settle such litigation. The American jury is seldom fair to the railroad when the case is one of injury to a passenger or employee, and it is only necessary for the injured one to present his case in a sufficiently pitiable manner to get a substantial verdict. The consequence is that the claim department often presents a very large budget at the year's end.

The equipment of a modern electric railway is by no means a matter of small expense, especially with materials at their present high prices. Where delicate and highly sensitive machinery falls into the hands of unskilled and ignorant men it always follows that its deterioration is abnormal. Mr. Irwin contended that it is possible to go too

far in endeavoring to make machinery "foolproof," and that adequate training of motormen is a better method of solving the problem of safe and economical operation. So-called "foolproof" equipment is enormously expensive, and while simpler in its handling from the outside, is necessarily of a highly complex nature internally. The present machinery is simple enough for a man of any intelligence to handle, provided he is properly trained. No matter how far the human element is reduced in the running of cars, in the end it is always necessary to have some kind of a man on hand, if only to press a button, and the bungler will often press the wrong button in emergencies. An efficient man can do his work better, more cheaply and with greater safety than his less intelligent brother, regardless of the simplicity of the machinery. No university course is needed for the making of a good motorman. All that is required of him is that he know perfectly his signals, realize to some extent the importance of starting and stopping cars properly in guarding the public safety and have some knowledge of the inner workings of his car. The training should be such as to cause the motorman to do the right thing subconsciously in emergencies, without stopping to reason out a long train of mental and manual processes.

The speaker then exhibited a large number of lantern slides of instruction cars and street railway schoolrooms taken in different parts of the country, following which a series of motion pictures were shown illustrating the methods of stopping runaway cars on down grades when the brakes are out of commission and the trolley off, through control by generation; the training of motormen inside the special instruction car of the Bay State company; the correct and incorrect methods of coupling cars and of starting a car with its wheels on a sanded rail; the method of resuscitating a person under the influence of an electric shock, and the operation of lifting jacks. On the Bay State system lifting jacks having a capacity of 15 tons with the application of 150 lb. 6 in. from the end of the handle are in use, the handles being carried on the car roof. The jacks weigh 95 lb. each, and car crews all over the system have been instructed in their use. Moving pictures were also shown of the handling of a car controller by proper and improper methods, an ammeter in circuit reading 400 amp when the handle was thrown too rapidly from notch to notch and only 150 amp maximum when proper pauses were made at the various points.

In a brief discussion which followed, C. S. Ching, chief inspector Boston Elevated Railway Company, emphasized the importance of proper training for conductors and touched upon the influence of employees upon the public. He advocated closer following-up of new men in the service and outlined the work of the employment department of the Boston company, with its facilities for trying out new men upon a spare track 1000 ft. long, the supervision of new men by chief division inspectors and experienced motormen, use of an instruction car, and testing methods adapted to bring out the ability of new men to handle cars on greased rails or with brakes purposely disconnected, with dummies unexpectedly thrown in front of the car, etc. In closing, he pointed out the vital importance of a neat personal appearance on the part of car service employees, who stand as the immediate personal representatives of the company to the public.

A. W. Senter, superintendent of one of the Boston divisions, gave a few reminiscences of his experience in charge of the company's employment office and urged the importance of exercising great patience and courtesy in dealing with new men. The offices where applications are received for employment should be as attractive as any on a road and should impress the applicant with the company's standards when he first appears at the door. In conclusion, he advocated following up the older men and their work on the cars in a tactful and progressive manner to better the quality of their work.

EXHIBIT OF NEW YORK STATE RAILWAYS AT SYRACUSE

A highly commended feature of the first Syracuse Industrial Exposition, which was conducted by the Syracuse Chamber of Commerce from April 21 to May 3, was the exhibit made by the New York State Railways, Syracuse Lines. This display not only embraced constructional features of railroad operation but also included publications relative to traffic and safety promotion.

As shown in the accompanying view, the company presented a 4-ft. x 7-ft. section of standard track, with concrete foundation 6 in. below the steel ties, 95-lb. T-rail and sandstone block pavement, the piece weighing between 1½ tons and 2 tons. A standard joint with the same rail and tie illustrated the bonding. The latest line construction was represented by standard concrete poles each containing 317 lb. of twisted steel bar reinforcement and weighing 3200 lb. each. The booth itself was arranged as a section of overhead construction with standard overhead double trolley of No. 0000 copper wire, span wire, guys and pull-offs, one 500,000-circ. mil feeder and one 1,000,000-circ. mil

Exhibit of New York State Railways at Syracuse Indus-dustrial Exposition

feeder, all supported by miniature concrete poles 10 ft. high. Specimens of the aluminum, steel and copper wires over which the 60,000-volt transmission current is received from Niagara Falls were also displayed.

The traffic division included a chart which showed the population of Syracuse from 1880 onward and the number of cars owned in the corresponding year. In 1880 one car was operated for every 1850 persons; 1890, one for every 2940 persons; 1900, 1620 persons; 1905, 830 persons; 1910, 690 persons; 1913, 650 persons. A traffic chart of the Dudley division showed the public the method which is used to determine where extra cars are needed. Other exhibits were a chart of the revenue and transfer passengers carried from 1897 to 1912, a large map of Syracuse, with small red squares to indicate the location of each car on the system at 6 p. m. and photographs of each type of car purchased for Syracuse since 1870. The attendants at the booth distributed vest-pocket celluloid time cards, one side of which carried the schedule of the limited trains over the Oneida Railway between Syracuse and Utica and the other side a map of the entire system from Syracuse to Little Falls and Rome.

The safety campaign of the company was strikingly emphasized by the use of a roller sign which contained a motor-driven endless belt for displaying cards containing sentences and pictures like the following: "When crossing car tracks look both ways." "Never pass behind standing car without looking for a car in opposite direction." "Safety first." "Caution will prevent accident." "Never get on or off a moving car." "Never allow children to play in the streets." "Look out for autos and other vehicles when alighting from car." "Wait until car stops before alighting." "Alight from car facing front." "Never board a moving car." "Keep arms and head inside of car." Illustration of an automobile accident, the result of reckless driving. Illustration showing alighting accident, the result of alighting from a moving car. Illustration of a woman with a child passing around the rear of the car from which she had alighted directly in front of another car coming in the opposite direction, the woman heedless of the approaching danger.

In connection with the safety campaign the company also distributed 15,000 buttons bearing such phrases as: "Caution will prevent accidents," "Avoid accident; look out for the cars," and "Don't play in the street." A booklet containing articles on public service and public safety was circulated. This publication reviewed the growth of street railways in Syracuse, showing how it had more than kept pace with population, and mentioned some of the expenditures which the company had made in recent years for the improvement and enlargement of its service.

HIGH SCHOOL BOYS AS CONDUCTORS IN DENVER

The grade conditions in Denver permit the operation of trailers, and in consequence the company has used trailers extensively during the rush hours for a number of years. Each trailer carries a separate conductor, and this condition has produced a demand by the company for trainmen willing to work for only part of the day. The morning rush-hour service lasts about two hours and the afternoon rush-hour service about two and one-half hours, so that trailer conductors put in only from four and one-half hours to five hours a day.

Two or three years ago several students who were working their way through college applied for the positions of conductors on these trail cars and proved so efficient that the company has been employing them in increasing numbers. At the beginning of 1912 it had thirty-five of these young men at work, and at the present time it has eighty. A minimum age limit of sixteen years is in force, and the applicant for a position must submit to the company a letter that this plan has the approval of his parents as well as the approval of the authorities of the high school or the university at which he is in attendance. These young men receive the same pay per hour as the regular trainmen; that is, 24 cents per hour during the first year, 27 cents per hour during the second year, etc., and this income has enabled a number of young men to pay their way through college. The school authorities have shown a willingness to co-operate with them and the company so far as they can in arranging the school duties to accord with this work.

In addition to the rush-hour business, the young men receive an opportunity to put in a regular day's work as an extra or as a regular on Sundays and holidays and also to do snow plow duty, and many of them take these runs. Regular men are not averse to this plan because it affords them an opportunity of getting off occasionally on Sundays and holidays. As all the conductors of the Denver City Tramway Company are also broken in as motormen, there is always a supply of motormen for Sunday and holiday operation with the boy conductors.

The "trailer boys," as they are called in Denver, are not confined to young men who are working their way through school or college. Many of them belong to prominent and wealthy families, as their parents consider the service an excellent business training. The boys make good employees and report as regularly for duty as the older men. They also learn their duties quickly. The number of applicants is always more than the number required. The successful applicants are selected by the superintendent and are always asked why they desire to enter the employ of the company. Their antecedents are also looked up. They are then told that the work is hard and not play. If accepted, they are then put through the regular course of instruction. The plan has reduced the extra list to a considerable extent, and after the trailer boys are engaged in other business they are good friends of the company as they understand the difficulties of railway operation.

REPORT OF COMMITTEE ON SCHEDULES AND TIMETABLES

A meeting of the committee on construction of schedules and timetables of the Transportation & Traffic Association was held at the headquarters of the association in New York on May 27. The following members of the committee were present. J. E. Duffy, chairman, Utica, N. Y.; T. F. Grover, Terre Haute, Ind.; Alexander Jackson, Newark, N. J., and J. J. Dempsey, Brooklyn, N. Y. W. O. Wood, Long Island City, N. Y., also met with the committee for a portion of the time.

The committee considered in some detail the compilation of data collected by means of inquiry form No. 101, and in view of the great amount of material on hand it was decided that the work could be handled more expeditiously by assigning specific subjects to the committee members present. In accordance with this plan, the following program was approved: Mr. Duffy will take up that section of the report to be devoted to methods of keeping time of trainmen, Mr. Dempsey will consider the development of forms of detention reports and also the matter of near-side stops, Mr. Grover will develop the matter of determining just what information should be shown on timetables, and Mr. Jackson will take up the subject of destination signs and forms of timetables for city operation. These gentlemen will submit their findings to the whole committee, and it is expected that the report in final form will be ready by July 1. In this report the committee will endeavor to submit definite recommendations on the subjects mentioned rather than merely a summary of the practice in vogue by the member companies.

PASSENGER TRAIN DELAYS IN NEW YORK

The Public Service Commission, Second District, New York, has recently issued a statement of passenger train delays which occurred in the State of New York during December, 1912. The totals from the figures given in the statement are as follows:

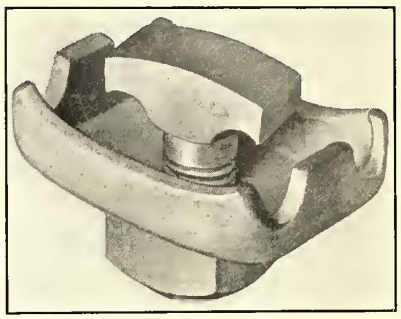
Total number of trains reported	64,788
Per cent of trains on time at division terminal	78
Per cent of trains late at division terminal	22
Average delay for each late train, minutes	28.2
Average delay for each train run, minutes	6.1

A summary of the principal causes of delay is shown in the following table, the results being expressed in percentages of the total number of delays:

	Per Cent
Engine failures	4.5
Other equipment failures	1.8
Wrecks	4.3
Unfavorable conditions of track	1.4
Waiting for trains on other divisions	37.0
Waiting for train connections with other railroads	20.2
Meeting and passing trains	4.8
Signals	1.3
Trains ahead	8.5
Waiting for orders	0.2
Train work at stations	11.1
Storms	0.9
All other causes	4.0

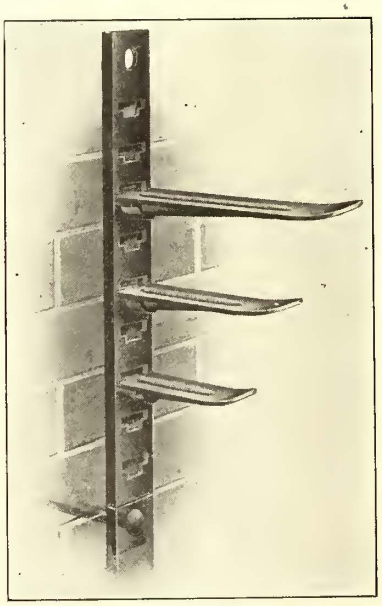
NOVEL DESIGNS OF CABLE CLAMPS AND CABLE BRACKETS

Among the various cable-line accessories which recently have been placed upon the market by the Barnes & Kobert Manufacturing Company, New Haven, Conn., two radically new devices are included. One of these, a guy clamp, is based upon the obviously effective principle of introducing a slight bend in the cable which is to be gripped, the clamp being thus enabled to exert a vastly greater holding power than could be established by means of the friction grip alone. This device, as shown in the accompanying illustration, is made from pressed steel and consists of but one piece in addition to the bolt and nut. In operation it is laid upon the two strands which are to be clamped together, each strand fitting into the two recesses provided on either side and the T-headed bolt being turned into the position shown in the cut. When the steel strands are in place the bolt head is turned at right angles and is pulled down onto the cables by setting up the nut. This puts a slight bend in each strand and gives a holding power generally in excess of the strength of the rope.



New Cable Accessories—Single-Bolt Guy Clamp

This method of application avoids the necessity for removing the bolt when the clamp is applied and reduces materially the time and labor required for application. Since the device is made of pressed steel, the weight is extremely low and this serves as another means for keeping down the cost of shipping, handling and erecting the clamps when they are used in large lots. The design shown in this illustration is of the single-bolt type, good for a pull of 1200 lb. and intended for ¼-in. and 5/16-in. rope used for trolley span wire, but a two-bolt type good for ⅜-in. and 7/16-in. strands is also made, the difference being that the latter type in addition to the extra bolt has a bridge in the center between the bolts to put a double bend in the strand when the bolts are set up. This gives it a holding strength which under test has been found to be in excess of 15,000 lb.



New Cable Accessories—Adjustable Bracket

The cable bracket which has been brought out as a part of the same line of accessories as the cable clamp is also made of pressed steel throughout and is composed of a slotted rack into which are inserted any desired number of bracket arms. The rack, as shown in the accompanying cut, is in the form of a channel iron and is furnished with an offset end at the bottom which permits a number of racks to be placed one above the other to form a continuous piece extending up the side of a tunnel or wall upon which it is desired to support cables. The T-shaped slots are located in the racks at intervals of 1½ in. and the bracket arms can in consequence be set at any desired elevation with a close degree of adjustment. The arrangement permits the insertion or removal of a bracket arm with a vertical movement of only 5/16 in., and as all pieces are stamped out of steel in the process of manufacture complete interchangeability is assured and any arm can be inserted in any slot.

The bracket arm is made with a T-shaped head, the wings of which catch in the narrow part of the T-shaped slot in the rack when the arm is down in place, and a groove is pressed into the arm to give it transverse strength as a beam in carrying its load. At the inner end of the arm a heel-piece of steel is electrically welded on, and this rests against the face of the rack, serving to take the thrust set up by the presence of a weight at the end of the arm. The arms are made in 10-in., 7-in. and 4-in. lengths to suit different conditions, and they are made wide enough to prevent any cold-flow of lead cable sheaths resting upon them. The bracket is strong enough to hold a 200-lb. weight on the end of the 10-in. arm so that there is no danger of damage if it should happen to be used as a ladder by employees working on the cables which it carries.

Other accessories in pressed steel made by the manufacturers of the above-described devices are wood-strain insulators with steel caps crimped on to the wood and sectional mushroom guy anchors designed to eliminate the bulk and weight of the wooden blocks often used for this purpose. All of these cable accessories receive a heavy galvanizing coat to prevent deterioration by rusting.

NEW REPAIR SHOPS FOR NEW HAVEN ELECTRIC LOCOMOTIVES

Repair ships designed to handle all of the now extensive electrical equipment of the New York, New Haven & Hartford Railroad are approaching completion at Van Nest, Bronx Borough, New York City. It is expected that they will be in operation by Aug. 1, or a short time before the electrification of the road from Stamford to New Haven is finished.

The new shops at Van Nest represent an outlay of about $650,000, and they will be complete in every detail. Until now repairs to the electric locomotives have been made at the Stamford shops, but the increase in electric equipment due to the electrification of the road as far as New Haven has necessitated a more elaborate plant where the repair work could be done to better advantage. The new location at Van Nest, on the Harlem River Branch, was decided upon mainly because of its nearness to the great Harlem freight terminal of the road, which is already electrified and where a large part of the electrical equipment must necessarily be employed.

The new shops cover two acres of ground. They are made up of an inspection shed, a repair shop proper, a lye vat house, a blacksmith shop, a storehouse and a heating plant. The inspection shed has four pit tracks, 375 ft. long. The repair shop proper covers nearly an acre and a half of ground and is two stories high. The heating plant covers 3000 sq. ft. of ground and the storehouse 7500 sq. ft. All are built of red brick.

The new shops will handle the repairs on sixteen switching locomotives, forty-seven passenger locomotives and thirty-six freight locomotives, a total of ninety-nine, and in addition part of the work on twenty-three multiple-unit cars. Not all of these locomotives are in service as yet, most of the new freight engines being held in storage at Van Nest. However, after the completion of the electrification to New Haven it is planned to have all trains, both passenger and freight, operated by electric power between the Harlem terminal and New Haven.

News of Electric Railways

Verdier Act Constitutional

On May 21 the Circuit Court at Detroit, Mich., handed down a decision declaring the Verdier home rule act, under which the municipal ownership charter amendment was adopted, to be constitutional. On the other hand, an order was issued compelling the Common Council to rescind its action in appropriating $250,000 to be used in building a crosstown bus line in opposition to the rights of the Detroit United Railway, which claimed that, under its franchise, it had the right to make the first proposition on any extensions or additional lines to be built.

The decision as to the constitutionality of the Verdier act was rendered in the case brought by George H. Barbour, Fred T. Moran and Charles A. Ducharme, who asked that Mayor Marx of Detroit be restrained from appointing a commission and that the issue of bonds under the charter amendment be prevented. The court spent much time in the consideration of the constitutionality of the Verdier act. The judges were unanimous in their opinion as to the constitutionality of the act, but Judge Hally dissented as to the right of the city to issue $10,000,000 of bonds. The majority opinion was signed by Judges Hosmer, Van Zile and Mandell. It follows:

"I agree with Judge Hally that the Verdier bill was printed as required by the constitution; that the question as to whether it was immediately necessary for the preservation of the public peace, health and safety was for the Legislature and not for the courts; that it is the duty of the Legislature to fix the general bonding limits of cities; that this power cannot be delegated to the people, and that a city can issue bonds on its faith and credit only to the extent of the difference between its debt and its borrowing limit.

"Still it would seem that a perfectly natural and constitutional construction can be given to the section under consideration. Section 4, before amendment, prohibited cities from pledging their credit for street railways except to the amount of the margin between existing indebtedness and 4 per cent of the assessed value of the real and personal property in the city.

"By successive amendments to the charter a city might raise its borrowing power to the legislative limit of 8 per cent and yet be prohibited from purchase of a street railway by any issue of bonds other than those which imposed no liability upon the city. It was to change this that the Verdier bill was enacted.

"I fully agree with Judge Hally that the constitutional convention expected the cities to procure funds for street railways by bonds which did not impose a liability on the city, but I am unable to find anything in the constitution which prevents the Legislature from giving cities the authority to use the borrowing power between the debt and general limit of bonded indebtedness for this purpose.

"In leaving to the Legislature the bonding limit, the constitution has empowered that body to open the door to the purchase of public utilities on the credit of the city if it sees fit, and the finding of the act unconstitutional in nowise tends to prevent this. The Legislature may raise the limit so that the margin is sufficient.

"Subject to the restriction that a city's debt must not exceed 8 per cent of the assessed value of property exclusive of special assessment district bonds, and 10 per cent inclusive of all bonds, subject to the provision that the charter of a city shall not be changed by increasing the limit of its indebtedness oftener than once in two years, and subject to the further provision that no single increase shall exceed 2 per cent, a city may use any borrowing power which remains, not exceeding 2 per cent, for street railway purchase or installation.

"The bill should be dismissed without prejudice to the right to attack the charter amendments should they prove to be beyond the scope of the act."

The case will be carried to the Supreme Court, and until a decision is secured the $10,000,000 of bonds provided for in the charter amendment cannot be sold. Mayor Marx said that as soon as the Supreme Court has passed upon the matter bonds will be sold to provide funds for the work of investigating conditions.

The court held that there is no reason for placing $250,000 on the budget of the park commissioner for general transportation purposes and that he had no right to make the request. Even if it had been legal for him to have the amount placed to the credit of his fund he could not spend it under the present laws. The judges were unanimous in their decision with respect to this matter.

Mayor Marx of Detroit has decided upon John F. Dodge and Joseph F. Stringham, Republicans, as two of the members of the city street railway commission, under the plan provided by the charter amendment adopted on April 7, 1913. The other candidates, whose names have been suggested by labor organizations and the Municipal Ownership League, are William D. Mahon, president of the Amalgamated Association of Street and Electric Railway Employees; John Clarken, Frederick F. Ingram, George William Moore, Thomas L. Dalton and John McVicar. The Federation of Labor wants either Mr. Mahon or Mr. Clarken, while the advocates of municipal ownership will be satisfied with any one of the other four.

On May 20 it was discovered that Mayor Marx had neglected to submit a request to the board of estimates for $100,000 to be used to defray the expenses of the street railway commission in its endeavor to unravel the tangle into which the railway question has been thrown. It is possible that this will temporarily delay effectual work in that direction.

Carriers' Committee Confers with I. C. C. on Valuation

Twelve presidents and several vice-presidents of railways, headed by Samuel Rea, president of the Pennsylvania Railroad, met in Washington on May 26, 1913, to confer over the proposed physical valuation of the properties of the American railways which Congress has directed the Interstate Commerce Commission to make. These officials constitute the physical valuation committee of the interstate carriers of the country, and they met the members of the Interstate Commerce Commission to exchange views on the character and extent of the work and to express their willingness to co-operate in the preparation of all data required. The board of engineers appointed by the commission, the personnel of which was given in the Electric Railway Journal of May 3, 1913, page 823, has been meeting since May 1 and conferring with the commission as to plans for the work of valuation. As soon as working plans are approved by the commission forces will be organized for active operations in the field.

The tentative valuations reached by the commission must be submitted to the railway carriers, the Department of Justice and the governors of the states in which the railroad properties are located, and to such other persons as the commission may name. After such a tentative valuation has been made, thirty days will be allowed for filing a protest. If no protest is filed, the valuation will become final. But if a protest is filed the commision will proceed with hearings at which testimony, briefs and arguments will be received.

Rapid Transit Matters in New York

The Public Service Commission for the First District has called for bids, to be opened on June 24, 1913, for the construction of Section No. 4 of the Broadway-Fourth Avenue Rapid Transit Railroad. This railroad will be operated by the New York Municipal Railway Corporation under the dual system contracts. The Broadway subway is now under construction from Trinity Place and Morris Street to a point in Broadway midway between Houston and Bleecker Streets. Section No. 4 extends from this point north under Broadway to a point 390 ft. north of the southerly line of Fourteenth Street. It will be a four-track subway, and the section includes a local station at Eighth Street and half of the express station at Union

Square. The contractors will bid for construction only, which will not include the laying of tracks or the finishing work in stations.

The first plans for elevated railroad improvement under the dual system contracts were submitted by the New York Municipal Railway Corporation for the proposed connection of the existing Myrtle Avenue and Broadway elevated lines in Brooklyn. The Public Service Commission approved the plans, on the condition that the company will invite competitive bids for the construction work. The plans call for the alteration of the existing structures and their connection so that trains may operate freely from one line to the other.

Department of Public Utilities Suggested for Cleveland

In a printed explanation of the provisions incorporated in the proposed new charter for the city of Cleveland the Charter Commission states that a department of public utilities should be established to control all municipal enterprises which derive no revenue from taxation. The reports of this department are expected to show clearly the results of the operation of the enterprises under municipal ownership. The power of the city to own and operate public utilities, as granted in the home rule amendment, would be left unrestricted by the commission, but the charter will require that the business and the accounts of all such utility enterprises shall be kept separate and distinct. As to franchises, the charter will provide that no exclusive grants shall be permitted. The Council may, by ordinance, grant franchises, but all ordinances making grants or renewals shall reserve to the city the power to regulate, the right to terminate the grants and to purchase the property. The commissioner of the division of franchises will be charged with the enforcement of the provisions of the utility grants. The voters of the city must adopt the charter that has been framed by the commission or continue to be governed under the code which was formulated for those cities which fail to make new provisions or prefer to operate under the state plan.

Wages and Hours to Be Arbitrated in Buffalo

According to E. G. Connette, president of the International Railway, Buffalo, N. Y., the representatives of the employees of the company and the officers have succeeded in adjusting all the questions at issue between the men and the company except the rate of wages and the section covering the number of hours in which runs shall be completed. Mr. Connette is quoted as follows:

"The company and the committee representing the employees who are members of the association have had many conferences and have succeeded in adjusting a majority of the complaints which were presented, each party showing a desire to settle all questions, without arbitration, and practically all have been settled with the exception of the rate of wages and the section covering the number of hours in which the runs should be completed. Being unable to agree upon the wages and the number of hours in which the runs shall be completed, we have decided that the matter should be left to arbitration, as prescribed in the agreement which was made in the presence of the Mayor on April 11, 1913."

The men have selected Assemblyman Edward D. Jackson as their representative on the board of arbitration.

Franchise Negotiations at Des Moines

E. G. Schmidt, president of the Des Moines (Ia.) City Railway, was quoted in part as follows recently in regard to the development plans of the company:

"We plan to operate a system that will cover the territory contiguous to Des Moines like a net. We have surveyed as far as Indianola for the Osceola line. This will serve a territory which is not reached by railroad and which lies between the Osceola and the Albia branches of the Burlington. Farmers along the line already have come to the offices of the company here to ask us to start work on this line. Under the new state law they can vote taxes to help in the construction of the line and they are anxious to get busy on the proposition.

"Action along this line must await the determination of the franchise issue here. We cannot build the spokes of the wheel until we have the hub. When we have the Des Moines City Railway on a firmer basis we will be ready to begin work on the proposed interurban system. I can say nothing about the franchise question except that we are seeking a franchise and that we wish a 5-cent fare."

Work Begun on Cleveland & Youngstown Line

Construction work has begun on the Cleveland & Youngstown Electric Railroad. At the head of the syndicate which promoted the road are W. S. Hayden, president of the Chamber of Commerce; Otto Miller, of Hayden, Miller & Company, Cleveland, Ohio, and J. R. Nutt, secretary of the Cleveland Savings & Trust Company. The company is reported to have purchased a right-of-way wide enough for four tracks through to the new terminal station, which will occupy a site bounded by Ontario Street, Prospect Avenue, West Third Street and Canal Road, Cleveland. The road will run almost entirely on a private right-of-way, its general course following the brink of Kingsbury Run.

The plan to build the Cleveland & Youngstown Railroad originated with O. P. and M. J. Van Swearingen, of the Van Swearingen Company, Marshall Building, Cleveland. W. H. Gratwick, Buffalo, who owns large lake shipping interests and is conected with the Ontario Power Company, is associated with them.

New Road Opened in Georgia.—The Albany (Ga.) Transit Company has completed and placed 4½ miles of line in operation in Albany.

To Report on Municipal Line.—The city commissioners of Edmonton, Alberta, Can., have been instructed to report in regard to the means which should be adopted to make the Edmonton Radial Railway, a municipal line, pay.

Tramway for Guayaquil.—It is reported from Panama that R. W. W. Hebard, head of the Panama Tramway, will make preliminary studies in connection with the construction of a tramway system for the city of Guayaquil, Ecuador.

Differences Between Company and Employees at New Haven Adjusted.—It is announced that the differences between the officers of the Connecticut Company and the representatives of the trainmen on the company's New Haven lines in regard to the recent discharge of shop employees have been adjusted. The trainmen were reported to have voted to strike if necessary to enforce their demands in regard to the shop employees.

Increase in Wages in Louisville.—The Louisville (Ky.) Railway has announced an increase in wages for all of its employees who are paid by the hour and whose compensation does not exceed 23 cents an hour. The increase is 1 cent an hour for all those falling in this classification. All of the motormen and conductors are paid by the hour, a sliding scale, depending on the length of service, being used to determine the rate of pay. The increase is effective on June 1, 1913.

Investigation of New Haven Railroad by Department of Justice.—An investigation of the New England railroads to determine if they are violating the Sherman law has been begun under orders from Attorney-General McReynolds. This investigation follows the inquiry of the Interstate Commerce Commission into the regulations and practices of the New England roads. The Department of Justice will look into alleged traffic agreements and the holdings of the railroads in subsidiary companies, including electric railways and steamship lines.

Riot at Jamestown.—The Jamestown Street Railway and the Chautauqua Traction Company, Jamestown, N. Y., are reported to have been compelled to suspend service on May 27, 1913, on account of rioting by trainmen of the companies who are on strike and by strike sympathizers. The rioters conducted a demonstration in front of the residences of A. N. Broadhead and S. B. Broadhead, who are the principal owners of the companies. Considerable damage is reported to have been done at the Broadhead

Woolen Mills. Some of the saloons were closed on May 27, 1913, at the request of Mayor Carlson.

Chicago Surface Railway Merger Status.—The local transportation committee of the City Council of Chicago, Ill., voted on May 24 that it would not approve a clause in the proposed merger ordinance guaranteeing the surface railway companies the rate of return which they now receive. When this decision was reached by the committee, L. A. Busby, president of the Chicago City Railway, announced that the companies would not consolidate unless they were protected by a rate of return stipulated in the ordinance. The committee thereupon voted that the Board of Supervising Engineers, Chicago Traction, report to the committee what improvements in service can be effected by action of the City Council.

Differences Between Employees and Company Adjusted in Springfield.—The differences between the Springfield (Mass.) Street Railway and its employees have been settled, but the details of the adjustment have not been made public. According to the Springfield *Republican*, "the settlement of the matter without resorting to a strike closed one of the most interesting cases that ever came up in labor circles in this city." The differences between the officers of the company and the representative men are said to have been caused by the question of the interpretation of the phrase "any member of the association" as contained in the agreement between the company and the men, the organization among the men having extended its influence recently from the trainmen to members of the clerical force.

Arbitrators Chosen in Cincinnati.—Walter A. Draper, secretary of the Cincinnati (Ohio) Traction Company; John P. Frey, editor of an iron molders' paper, and Herman Schneider, dean of the engineering department of the University of Cincinnati, are the arbitrators who will decide the wages to be paid the employees of the company. Mr. Draper was selected by the company and Mr. Frey by the men and Dean Schneider was the choice of these two men as the third member of the board. The Cincinnati & South Covington Street Railway has recognized the union formed by its men. An attempt will be made by the officers of this company and representatives of the employees to reach an agreement in regard to wages, but if this is found impossible the matter will be submitted to arbitration.

Agreement Between Buffalo & Lake Erie Traction Company and Employees.—The conferences between the officers and representatives of the employees of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., have resulted in an agreement between the company and the men in regard to wages and terms of service which is to be in effect for three years. The employees of the company went on strike at the same time as the employees of the International Railway and like the employees of that company they returned to work under an agreement for the settlement of the differences at conferences between the men and the officers of the company with arbitration as a last resort. A minimum wage of 23 cents an hour and a maximum of 30 cents an hour are provided for trainmen except those employed on the Dunkirk belt line, who are to receive 2 cents an hour additional while working under the one-man system. New men are to receive 23 cents an hour. After six months the pay is to be 24 cents an hour and at the end of the year 25 cents an hour. From then on the rate is to increase until a maximum of 30 cents an hour is reached. Men employed on snow plows and men who work overtime are to receive pay on a basis of time and a half.

"Rate Research."—Within the year a new publication, *Rate Research*, published by the rate research committee of the National Electric Light Association, has entered the technical field and is doing a good work in compiling and digesting the decisions of the courts and commissions upon matters relating to the public service regulation of electric properties. This committee started out more than a year ago to supply certain members of the National Electric Light Association with current information upon this subject, and the need of a regular printed publication manifested itself. The committee has just completed its first printed volume, which is No. 2, containing 420 pages, the last number being a complete classification and index, which renders all of the information readily available. This index is probably the best bibliography of rate regulation information that is published and should be very useful in preparing briefs and other memoranda upon regulation matters. One interesting feature of this publication is the fact that it is not published for profit and carries no advertising and therefore is in no sense a rival of the technical papers. It supplements the work that such papers are doing by calling attention to all of the important articles which such papers publish on the subject of rate regulation. The commission announces that the publication is already on a self-supporting basis.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

ILLINOIS

Senator Clark introduced by request on May 21 Senate bill No. 644, which authorizes the purchase, lease, sale or consolidation of street railways, prescribes the mode, terms, conditions and effect thereof and provides for the acquisition of the stock of any dissenting stockholders. Any street railway within or partly within and partly without any incorporated municipality has the power to acquire any or all of the property rights, privileges, immunities and franchises of any other such corporations, or to dispose of its own property, etc., to another corporation, or to arrange for the operation of both systems under one management and control. Before a merger takes place the municipal authorities within which the greater part of the street railway is operated shall by ordinance declare that the public interest requires a unified system. The agreement to merge must be submitted to the stockholders of the affected corporations at a regular or special meeting. Two-thirds of all the outstanding capital stock of each of the corporations is required for a merger. The corporation acquiring all or substantially all of the property of any other corporation is liable for all the then outstanding debts of the other corporation. For the purpose of upholding rights each of the corporations merged or consolidated will be deemed severally to continue in existence. It is necessary for all merged or consolidated railways first to secure a franchise from the municipality. Stockholders must file notice of dissent within thirty days from date of the meeting at which the transfer was authorized and upon surrender of the certificate are entitled to the fair cash value of the stock at that date. If they refuse to part with the stock or the value cannot be agreed upon, the corporation within ninety days from the stockholders' meeting is to acquire the stock by the exercise of the power and right of eminent domain. Notices of sales or merger are required to be published for three weeks.

The Senate has passed the bill to authorize cities on a referendum vote to acquire and operate public utilities. This is one of the Dunne utilities measures.

The street car employees labor bill has been reported out with a favorable recommendation by the committee on labor and industrial affairs of the House. As amended by this committee, interurban employees are eliminated from the operation of the bill and street railway employees are not to be employed more than ten hours out of fourteen hours in any one day. The original bill called for not more than ten out of twelve consecutive hours and it was passed by the Senate with this provision. The amendments were adopted by a vote of ten to seven and the favorable recommendation by a vote of fifteen to two.

Senator Hurburgh's anti-pass bill to prevent the issuance of free transportation by steam or electric railroads has been reported out with a favorable recommendation by the committee on miscellaneous subjects of the House with a recommendation that it be passed. Amendments have been made to permit members of the Legislature, their families and one clerk or secretary to receive passes. Another amendment struck the words "in uniform" from the section referring to the free transportation of policemen while on duty. This amendment will give policemen, deputy sheriffs and coroners the right to ride free on street railways. Other amendments allow free transportation to the families of attorneys and physicians for railways. An amendment

to exempt members of Congress and their families and judges of courts of records and their families was voted down.

Conductors and motormen on the Mattoon (Ill.) City Railway have petitioned their representatives in the Legislature to vote against the bill providing that ten hours' employment for street railway employees must be within fourteen consecutive hours. They assert that the passage of the bill would mean a reduction in wages of about $100 a year for each man.

MASSACHUSETTS

The so-called "nine hours in eleven" bill continues to be a storm center of discussion in the Legislature. The committee on street railways recently reported a bill providing that a day's work for motormen and conductors shall not exceed nine hours in twelve consecutive hours, with a possible emergency extension to nine and a half. Representative Stevens of Marblehead has endeavored to substitute a straight nine hours in eleven bill for that favored by the committee and passed to a second reading in the House. Representative Duncan of Clinton opposed the demand for substitution. He said that a few years ago when a bill was passed restricting the hours but permitting the men to work longer if they desired it was found that many men preferred to work longer hours than those indicated in the bill. President Bancroft of the Boston Elevated Railway has sent a statement to the members of the Legislature protesting against the passage of the nine hours in eleven bill and stating that if it goes through it will be necessary to employ 1700 more men than at present. He also asserted that the attempt to settle the hours of employment is a plain violation of the agreement between the company and the employees' union.

NEW YORK

Governor Sulzer has vetoed the Yard bill to permit the construction of an electric railway on the Albany Post Road in Westchester County. The Governor has signed Senate bill No. 340, amending the general corporation law by adding a new Section 91-a, providing that "the Supreme Court shall have jurisdiction in equity at the suit of a corporation or of a receiver or trustee in bankruptcy thereof to compel one or more trustees, directors, managers or other officers of the corporation to account for injury to or losses of the funds, assets or property of the corporation caused by or through any neglect or failure of the defendants to perform, or by a violation of, their duties, and must upon application of either party make an order directing the trial by jury of the issue of negligence, and for that purpose the questions to be tried must be prepared and settled as prescribed in Section 970, Code of Civil Procedure." The Governor has vetoed the bill to amend the railroad law in relation to extending the time within which in certain cities a railroad may be constructed where there has been a receiver. The Governor has disapproved the bill to repeal the act for the preservation of the macadamized public highways of Queens County. The Governor said: "A repeal of this act would be solely, simply and purely a grant of unrestricted and unlimited power to the street surface railroads in Queens and Nassau Counties to monopolize the use of each and every macadamized public highway in both of those counties, without any regard to the public sentiment of the citizens thereof."

The Governor on May 28, 1913, vetoed the Murtaugh hydroelectric bill designed to permit the utilization of the surplus waters of the canal for the development of electric power by the State, and the Walters bill, which would have permitted quasi-public corporations to impound waters through the construction of dikes, watersheds, etc., and to market the water. The Governor has announced that he will appoint a committee of experts to investigate the question of water power development in the State and report to the next Legislature. The Governor has signed the Pollock bill providing that no stage routes or alterations or extensions of such routes in New York City shall be operated until a franchise has been obtained from the Board of Estimate and Apportionment.

PENNSYLVANIA

By a vote of 185 to 9 the House passed the public utilities commission measure on May 19. The bill was at once sent to the Senate, where it passed first reading and was made a special order for second reading on the evening of May 26. It is believed that it will now speedily pass the Senate and be signed by the Governor. Opposition to the bill in the House was led by Representatives Allen, Pittsburgh, and John R. K. Scott, Philadelphia, who charged that the influence of the State administration had been unduly exercised to defeat certain amendments which they had offered, including the granting to the commission of control over the issuance of stocks and bonds by corporations and requiring the commission to pass upon these securities before they could be offered to the public. Framers of the bill were against this amendment because they claimed it would nullify the purposes of the measure and should be covered in a separate bill. The amendments offered at the instance of Mayor Magee of Pittsburgh were designed to give municipalities the right to pass upon the extension of public utilities through the highways of these municipalities. An attempt by Mr. Allen to insert his amendments to the bill before final passage through unanimous consent, that the House go into committee of the whole for the purpose of considering the amendments, was defeated by a vote of 108 to 78. The bill as passed is a compromise measure between the Republican State Convention's legislative committee's bill and the state administration's bill. The Democratic bill was not seriously considered in the framing of the composite measure.

The Clark commission government bill for third-class cities, which has passed the Senate, was reported favorably to the House with an amendment designed to prevent the "ripping" of mayors and other regularly elected city officials out of office before their terms have expired.

As a result of the visit of A. M. Taylor, transit adviser to Mayor Blankenburg of Philadelphia, to Harrisburg the section of the all-Philadelphia revenue-producing bill limiting the use of the money received to the building of subways and other permanent improvements will be eliminated and provided for in a new measure to be introduced at once into the Senate. Both bills are scheduled for passage, it is stated. The main bill provides that all of the personal property tax, now divided between the county and State, shall go to the county, which would add $40,000,000 to the borrowing capacity of the county of Philadelphia.

PROGRAM OF ASSOCIATION MEETING

Central Electric Railway Association

The hotel and arrangement committee of the Central Electric Railway Association has made the following arrangements for the June meeting, which will be held on board the D. & C. steamship *St. Ignace*, which has been chartered for the exclusive use of the association members and families, for a two days' continuous trip from Lake Erie through the connecting rivers and Lake St. Clair into Lake Huron:

The steamer will leave the dock at the foot of Madison Street, Toledo, Ohio, at 3 p. m. sharp, on June 25, 1913, and will return to the same place at the corresponding hour on June 27, 1913.

The fare from Toledo for the round trip, including stateroom berth and meals, will be $12 per person.

Reservations can be made by applying to L. J. Drake, Jr., 410 Traction Terminal Building, Indianapolis, Ind., chairman of the hotel and arrangement committee. All reservations must be accompanied by remittance and the name and address of person or persons desiring accommodations, so as to comply with marine regulations

Each stateroom is equipped with an upper and lower berth. On account of the large attendance expected at this meeting, it will be necessary to place two persons in each stateroom; therefore it would be well for persons who desire to share the same stateroom to make reservations together. In making reservations, preference should be named for inside salon room or outside corridor room. Full fare will have to be charged for all children.

No applications received by mail after June 21 can be acted upon. Applicants at the boat on June 25 will be assigned space if any is left. A cordial invitation is extended to railway men who are not members of the association.

Financial and Corporate

Stock and Money Markets

May 27, 1913.

The market opened strong in New York to-day, but weakness developed suddenly in the forenoon and stocks were offered at substantial concessions. The railroad issues were affected by the developments in connection with the St. Louis & San Francisco receivership. New low records were established for all the securities of that system. Railroad and other bonds were irregular. Rates in the money market to-day were: Call, 2½@3 per cent; sixty days, 3¾@4 per cent; ninety days, 3¾@4¼ per cent; four months, 4@4½ per cent; five months, 4½@4¾ per cent.

The market in Philadelphia to-day was broad, but the volume of transactions was small. The demand for bonds was good.

The Boston market to-day was irregular during the early part of the session. Boston Elevated recovered on a small volume of transactions, up 1⅛.

The Chicago market continued narrow and extremely dull to-day. The demand for bonds has improved.

The market for stocks in Baltimore continued very narrow and dull to-day. The demand for bonds was good.

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

	May 21	May 28.
American Brake Shoe & Foundry (common)	92	93
American Brake Shoe & Foundry (preferred)	130	130
American Cities Company (common)	37½	37½
American Cities Company (preferred)	70⅜	70
American Light & Traction Company (common)	370	370
American Light & Traction Company (preferred)	106	106
American Railways Company	38	38
Aurora, Elgin & Chicago Railroad (common)	42	41½
Aurora, Elgin & Chicago Railroad (preferred)	84	84
Boston Elevated Railway	85¾	87
Boston Suburban Electric Companies (common)	7½	7½
Boston Suburban Electric Companies (preferred)	66	*66
Boston & Worcester Electric Companies (common)	a8	*8
Boston & Worcester Electric Companies (preferred)	43	43
Brooklyn Rapid Transit Company	91¼	91⅛
Capital Traction Company, Washington	120	120
Chicago City Railway	*150	*150
Chicago Elevated Railways (common)	*25	*25
Chicago Elevated Railways (preferred)	*87	*87
Chicago Railways, ptcptg., ctf. 1	89½	92½
Chicago Railways, p'cptg., ctf. 2	20¾	*21¾
Chicago Railways, ptcptg., ctf. 3	6	7
Chicago Railways, ptcptg., ctf. 4	*3½	3
Cincinnati Street Railway	115	112
Cleveland Railway	103¼	103¾
Cleveland, Southwestern & Columbus Ry. (common)	*5½	*5¼
Cleveland, Southwestern & Columbus Ry. (preferred)	*28¼	*28¼
Columbus Railway & Light Company	18	18
Columbus Railway (common)	a69½	69½
Columbus Railway (preferred)	83	83
Denver & Northwestern Railway	109	109
Detroit United Railway	72	85
General Electric Company	138⅞	139⅜
Georgia Railway & Electric Company (common)	117	116
Georgia Railway & Electric Company (preferred)	84	84
Interborough Metropolitan Company (common)	14½	14⅜
Interborough Metropolitan Company (preferred)	50¾	50½
International Traction Company (common)	*40	*40
International Traction Company (preferred)	*95	*95
Kansas City Railway & Light Company (common)	..	..
Kansas City Railway & Light Company (preferred)	..	..
Lake Shore Electric Railway (common)	9	*9
Lake Shore Electric Railway (1st preferred)	91	*91
Lake Shore Electric Railway (2nd preferred)	25	*25
Manhattan Railway	129½	130
Massachusetts Electric Companies (common)	16	14½
Massachusetts Electric Companies (preferred)	72½	72
Milwaukee Electric Railway & Light Co. (preferred)	100	*100
Norfolk Railway & Light Company	26½	*26½
North American Company	71	70
Northern Ohio Light & Traction Company (common)	80	80
Northern Ohio Light & Traction Company (preferred)	105	105
Philadelphia Company, Pittsburgh (common)	44	44
Philadelphia Company, Pittsburgh (preferred)	40½	40½
Philadelphia Rapid Transit Company	23¼	23⅞
Portland Railway, Light & Power Company	67½	*67½
Public Service Corporation	114	106
Third Avenue Railway, New York	34	16
Toledo Railways & Light Company	a12	a12
Twin City Rapid Transit Co., Minneapolis (common)	104	103
Union Traction Company of Indiana (common)	7½	*7½
Union Traction Company of Indiana (1st preferred)	82	82
Union Traction Company of Indiana (2d preferred)	32	32
United Rys. & Electric Company (Baltimore)	27	..
United Rys. Inv. Company (common)	22	22
United Rys. Inv. Company (preferred)	44	43¾
Virginia Railway & Power Company (common)	53	55¾
Virginia Railway & Power Company (preferred)	90	92
Washington Ry. & Electric Company (common)	90	89
Washington Ry. & Electric Company (preferred)	90	89
West End Street Railway, Boston (common)	72½	72
West End Street Railway, Boston (preferred)	88	88
Westinghouse Elec. & Mfg. Company	62	65½
Westinghouse Elec. & Mfg. Company (1st preferred)	110	111

*Last sale. aAsked.

ANNUAL REPORTS

Mexico Tramways

The statement of income, profit and loss of the Mexico Tramways, Mexico City, Mex., for the year ended Dec. 31, 1912, follows:

Earnings from traffic	$6,639,484
Miscellaneous earnings	183,191
Gross earnings	$6,822,675
Less operating and general expenses, maintenance and taxes	3,206,899
Gross profit from operation	$3,615,774
Less rentals and fixed charges	596,824
Net profit	$3,018,950

The report submitted by W. E. Davidson, secretary, says in part:

"The net revenue in gold for 1912, after paying all expenses and fixed charges, amounted to $1,830,480, which with the balance brought forward from 1911 makes a total credit balance to the profit and loss account for the year of $2,617,046, out of which the directors have during the year paid to the shareholders four quarterly dividends at the rate of 7 per cent per annum, leaving a balance in the profit and loss account of $1,462,928, which has been carried forward. The ratio of operating expenses to gross income for the year 1912 was 47 per cent as compared with 48.57 per cent in 1911.

"In order to insure proper protection of the company's properties and the continuous operation of its service during the recent disturbance in Mexico, the management was obliged to incur a considerable amount of extraordinary expenditure, and as a result the directors are glad to report that the company was able to maintain its services in a very satisfactory manner and did not sustain any serious damage to its property.

"On Dec. 31, 1912, the tramway system consisted of 208.30 miles of single track, of which 193.30 miles were operated by electricity and 15 miles by mules—the electric track mileage having been increased by 17.80 miles and the mule track mileage having been reduced by 4.55 miles.

"The first sections of the suburban lines to Toluca and Puebla respectively have been placed in operation, the Toluca section as far as Cuajimalpa, a distance of 5,405 miles from Santa Fé, and the Puebla section as far as Tulyehualco, a distance of 6.878 miles from Xochimilco. The mule lines were electrified during the year from Ixtacalco to Ixtapalapa, and from Tacubaya to Santa Fé. The property has been maintained in excellent condition and repair, and for this purpose $735,074.72, Mexican currency, has been expended during the year. The company has constructed during the year eleven first-class electric passenger cars, as well as eight other cars."

The accompanying table of comparative statistics was included in the report:

	1910	1911	1912
Average earnings per passenger per car per day	$57.15	$65.79	$72.36
Average passenger receipts per car mile	44.98	42.47	48.61
Operating expenses, not including taxes, per car mile, passenger and freight service	23.73	22.16	24.40
Daily average earnings from operation	15,985.59	16,887.05	18.614.88
Daily average operating expenses	7.626.55	7,901.08	8,468.37
Percentage of gross expenditures, including taxes, to gross earnings and income	49.06	48.57	47.00

West Penn Traction Company

The report of the West Penn Traction & Water Power Company, Pittsburgh, Pa., and subsidiary companies for the year ended March 31, 1913, just issued, shows an increase over the previous year of 56.5 per cent in gross earnings and 41.6 per cent in net earnings. Comparative statements of earnings for the two years ended March 31, 1912 and 1913, follow:

	1912	1913
Gross earnings	$2,427,481	$3,801,324
Operating expenses and taxes	1,216,797	2,086,224
Net earnings	$1,210,684	$1,715,100
Fixed charges	570,433	923,995
Balance	$640,251	$791,105
Guaranteed dividends	235,000	235,000
Surplus earnings	$405,251	$556,105

Report on Depreciation and Maintenance Charges in Louisville

The Louisville (Ky.) Railway has made public a report of a special committee of directors, of which Charles T. Ballard is chairman, appointed several months ago to examine into the accounting system used by the company. The committee found that in the ten years from 1902 to 1911 the charge to depreciation was $309,885 and for maintenance $3,460,483, a total of $3,770,396, against gross revenue of $24,326,410, or 15.5 per cent. During the past two years this amount has been increased to 16.66 per cent, but, the committee stated, this rate is under rather than over what is set aside by other conservatively managed electric railways. The committee added:

"We are not prepared to say just what percentage of gross revenue should be expended for maintenance or for depreciation, or for both together, but will give this matter our careful consideration, and we suggest that each member of the board also do so."

The committee also dealt in its report with minor matters of bookkeeping, with special reference to showing the condition of affiliated interurban properties. It also pointed out from figures in the report of the Second District Commission in New York that Louisville has more miles of track per 1000 of population than a number of other cities of about the same size. The committee called attention to the great drain on the resources of the company arising out of damage cases, characterizing a great many of them as little short of blackmail. It was stated, however, that whereas this item amounted to 9.3 per cent of the gross receipts in 1910, it had fallen to 8.3 per cent in 1912, and it is hoped that the results of the use of pay-as-you-enter cars, the use of safety gates and stopping at the first intersections will be still more favorable.

The present report is a summary of one made to the directors last November which was not made public at that time.

Opposition to Terms of Columbus Consolidation

Near the close of the hearing before the Public Service Commission of Ohio on May 20, 1913, on the petition for authority to exchange the stock of the Columbus Railway & Light Company for stock of the Columbus Railway, Light & Power Company, attorneys for the Columbus Light, Heat & Power Company objected to the basis of exchange for the stockholders of that company and demanded that the terms of the consolidation be readjusted. Attorney Joseph Clark, representing the Clark interests, replied that the selection of the directors was made by vote of proxies from the stockholders and that the large holders of stock of the company had been placed upon the board. The original petition for consolidation was filed on Feb. 12, 1913.

The stockholders of the Columbus Heat, Light & Power Company ask that they be placed upon the same basis as those of the Columbus Edison Company, while stockholders of the latter company intimate that they may withdraw from the plan if this is done. The commission has taken the matter under consideration.

Statistics of Electric Railways from Report of Public Utilities Commission of Connecticut

According to the report of the Public Utilities Commission of Connecticut for the year ended June 30, 1912, there are thirteen electric street railways operating in that State. The outstanding capital stock, representing the 1,020.326 miles of street railways owned, is $62,670,100. Of this amount $40,000,000 represents 471.667 miles owned by the Connecticut Company and $17,120,100 the 234.381 miles of the Connecticut Railway & Lighting Company, whose property is operated by the Connecticut Company. The remainder of $5,550,000 is the capital of the 314.278 miles of the other companies.

The amount of bonds issued and outstanding as reported by the various companies is $19,217,000, being $20,571 per mile of single track owned. The amount of floating indebtedness on 691.088 miles of single track owned is $2,011,579, or $2,910 per mile of road covered by such indebtedness. No indebtedness is reported as existing on the Bristol & Plainville Tramway, the Connecticut Railway & Lighting Company and the Providence & Danielson Railway.

The gross earnings of the nine operating companies for the year ended June 30, 1912, were $9,288,092, an increase of $490,563 over the earnings of the previous year. The gross earnings per mile of main track operated were $9,427; per car mile they were $0.2785, and per car hour, $2.594.

The operating expenses were $5,998,421, being $117,213 less than the expenses of the previous year, and were $6,088 per mile of main track operated, $0.1799 per car mile and $1.703 per car hour. The operating expenses were 64.58 per cent of the gross earnings. The net earnings for the year were $3,289,671, an increase of $607,776 over the previous year.

From the above net earnings the following deductions were made: The amount paid in dividends upon the stock of nine of the companies was $2,267,354. The interest amounted to $990,316. The taxes paid the State were $455,165. The car miles run were 33,348,849, an increase of 762,595 miles over the preceding year.

The number of fare passengers carried was 175,434,119, an increase of 9,231,935 over the number carried the previous year. This total compares with 85,960,797 passengers carried by the steam railroads for the same period. The average fare received from revenue passengers was $0.04983 and the average fare of all passengers, including those with transfers, $0.04199.

The average number of employees during the year was 5002, a decrease of 265 in the number reported last year.

Demand for Public Utility Bonds

An interesting article by Lawrence Chamberlain is published in the May issue of *Moody's Magazine* on the subject of why the public is leaning toward the purchase of public utility bonds rather than those of seasoned railroads or municipalities. As Mr. Chamberlain sees the situation, it is a result of a theoretically correct distribution of risk from the investor's viewpoint. To invest properly and to distribute the risk properly, a mere scattering of one's interest is not sufficient, for, aside from the risk of loss through the default of any particular securities, a further risk of loss exists through the chance of being compelled to liquidate at a time when the securities are suffering a general decline. The best way to eliminate this second risk is to invest in different types of bonds with the idea that should a subsequent decline come some types would be affected only moderately if at all.

To illustrate this method, Mr. Chamberlain shows that since 1905, irrespective of investment values, forces which have been at work have depressed railroad bonds 7 per cent, municipal bonds 16 points and public service bonds only 1⅛ points. According to bond men, the reason for the moderate decrease in public utility values is the fact that the demand for public utility securities has increased more rapidly than the demand for railroad and municipal bonds and is not because the railroads and municipalities have increased their obligations in greater ratio than the public service corporations. The demand for public utility bonds is based on the knowledge of the public that the purchasing power of a dollar has decreased in recent years and that public service bonds yield more on the cost than other types, the net return in 1905 being 1 per cent higher and in 1912 four-fifths of 1 per cent higher. The advantage of this superior yield is sought to offset in part the inefficiency of money. Then, too, public service bonds are growing in demand because the security fluctuates less than is the case with railroad bonds. This is not true of municipal issues, but at the average price level municipal bonds yield less than railroad bonds of equal security.

On the basis of these facts the market for public service securities is well founded and should continue to be so. To avoid the danger of being forced to liquidate at a loss due not necessarily to a weakened security but to the growing money inefficiency, it is wise for an investor not to confine his field to several issues of the same type but to scatter his holdings among several types of bonds, and on the basis of the last seven years, as Mr. Chamberlain

says, presumably less chance for loss in liquidation will occur if an investor favors public utility bonds in dividing his funds among the three types.

Earnings of Illinois Traction System for Quarter

For the last quarter of 1913 the Illinois Traction System, Champaign, Ill., reports the largest gross and net earnings in five years. The comparative statement of gross and net earnings for the past five years follows:

	Gross	Net
1909	$1,262,739	$533,286
1910	1,427,326	582,127
1911	1,650,698	635,602
1912	1,790,361	717,275
1913	1,880,460	766,338

Beaumont (Tex.) Traction Company.—Stone & Webster, Boston, Mass., have arranged to purchase property of the Beaumont Traction Company conditioned on the company securing an amended franchise from the City Council of Beaumont. The plan is to merge the Beaumont Traction Company with the Jefferson County Traction Company, which is building the interurban railway between Beaumont and Port Arthur. The Beaumont Traction Company desires an extension of its franchise for fifty years from Jan. 1, 1911, making the tenure of its rights the same as those of the interurban company.

Boston & Worcester Street Railway, Boston, Mass.—The Massachusetts Railroad Commission has approved an issue of $150,000 twenty-year 4½ per cent bonds of the Boston & Worcester Street Railway, the proceeds to be used to fund the floating debt and to secure new equipment.

Boston Suburban Electric Companies, Newtonville, Mass.—The shareholders of the Boston Suburban Electric Companies have authorized the cancellation of the 32,387 shares of cumulated preferred stock outstanding and the issue of notes in place of the same, holders of the preferred stock to have the option of taking cash or notes, or both, for their stock. Dividends to the amount of $10 a share have accumulated on the preferred stock, which bears $4 a share cumulative dividends. At present there are $1,100,000 of coupon notes outstanding.

British Columbia Electric Railway, Ltd., New Westminster, B. C.—The London (Eng.) Stock Exchange has listed a further issue of £750,000 of 4¼ per cent perpetual consolidated debenture stock of the British Columbia Electric Railway, making the total amount listed £2,787,155.

Brooklyn (N. Y.) Rapid Transit Company.—The directors of the Brooklyn Rapid Transit Company have placed the stock on a 6 per cent basis by declaring a quarterly dividend of 1½ per cent, an increase of one-quarter of 1 per cent. The dividend is payable on July 1, 1913, to holders of record of June 9.

Calumet & South Chicago Railway, Chicago, Ill.—The Calumet & South Chicago Railway has sold another $500,000 of its general mortgage 5 per cent bonds to the First Trust & Savings Bank, Chicago, Ill. This makes the total of that issue now outstanding $4,725,000.

Chicago (Ill.) Railways.—The Chicago Railways has sold to the First Trust & Savings Bank, Chicago, Ill., $1,500,000 of its first mortgage 5 per cent bonds. This brings the total of that issue now outstanding to $28,700,000.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—On May 23 the Cleveland, Southwestern & Columbus Railway was authorized by the Public Service Commission of Ohio to issue first mortgage thirty-year 5 per cent gold bonds of the aggregate principal sum of $5,103,000, first preferred capital stock of the par value of $1,500,000 and second preferred capital stock of the par value of $2,412,000, a note of which proposed issues was made in the ELECTRIC RAILWAY JOURNAL of April 26, 1913. These bonds to the principal amount of $5,000,000 and the first preferred stock are to be sold for the best price obtainable and for not less than 90 per cent of the par value thereof, it being the opinion and finding of the commission that the issue of all of the stocks and securities and the money to be secured by the sale of such portion thereof as is proposed to be sold are reasonably required for the proper purposes of the corporation. The proceeds from the sale of $5,000,000 of the bonds and the first preferred stock must be devoted to the payment, discharge and retirement of its outstanding funded indebtedness and floating indebtedness, secured by the pledge of its first consolidated mortgage bonds. The new first mortgage bonds, of the principal sum of $103,000, are to be issued to reimburse the company's income, on the basis of $500 par value of bonds for each $1,000 so expended, for moneys by it expended therefrom for the improvement and betterment of its plant and property since Sept. 1, 1912, and to be so expended, which improvements and betterments are estimated by the company to cost, completed in good and workmanlike manner, the sum of $129,758. The second preferred capital stock is to be exchanged, share for share, for the present outstanding preferred capital stock, of total principal amount of $2,412,000, provided the holders of the present outstanding first preferred capital stock waive, cancel, release and discharge any and all claims against the company for or on account of dividends accumulated or to accumulate upon the present preferred stock. The meeting of shareholders postponed from May 17 is to be held in the near future for the purpose of ratifying the above plans.

Columbus, Marion & Bucyrus Interurban Railway, Marion, Ohio.—Further details are available in regard to the incorporation of the Columbus, Marion & Bucyrus Interurban Railway to succeed the Columbus, Marion & Bucyrus Railway, which was noted in the ELECTRIC RAILWAY JOURNAL of May 24, 1913. Of the capital stock of $350,000, $100,000 is to be given to the purchasers of $100,000 of first mortgage 6 per cent gold bonds and $250,000 to holders of the present first mortgage 5 per cent bonds of the Columbus, Marion & Bucyrus Railroad. First mortgage 6 per cent twenty-year gold bonds, redeemable all or partly on any interest date at 102½ per cent and interest, are issued to be used as far as necessary to pay receivers' certificates, outstanding claims, receivers' and foreclosure expenses and to build a power house and additional trackage if such construction should be desired. All holders of the present bonds are allowed to subscribe for the new bonds in amounts equal to 20 per cent of their present holdings, with a bonus of 100 per cent in stock. There are also to be issued general mortgage gold bonds in the amount of $250,000, interest for the first and second years at 3 per cent, for the third and fourth years at 4 per cent and thereafter at 5 per cent. To the holders of the present first mortgage bonds who subscribe for their 20 per cent in the new first 6's there is to be allotted an amount equal to 50 per cent of their present holdings in these general mortgage bonds and 50 per cent in new stock. The subscribing holder of a thousand-dollar bond of the old company would thus receive $200 in new first 6's, $500 in stock and $500 in 3-4-5 per cent bonds of the general issue. This reorganization will require net earnings for the first two years of $13,500, for the third and fourth years $16,000, and thereafter $18,500, but the company expects that with improvements the net earnings will more than meet the interest. The committee in charge of the reorganization is composed of James H. Caldwell, Peter McCarthy, J. J. Tyler, Wells Campbell, Francis Henderson and James F. Livingston.

Commonwealth Power, Railway & Light Company, Saginaw, Mich.—The stockholders of the Commonwealth Power, Railway & Light Company and Union Railway, Gas & Electric Company have subscribed to $6,033,500 of the $7,500,000 of five-year 6 per cent convertible bonds of the former company, noted in the ELECTRIC RAILWAY JOURNAL of May 24, 1913, which leaves unsold $1,466,500, or less than 20 per cent of the entire amount.

Evansville (Ind.) Railway.—The Evansville Railway has purchased the Evansville & Mount Vernon Electric Railway and the Evansville Terminal Railway and has leased the Evansville, Henderson & Owensboro Railway. The transfer is shown by deeds which have been recorded in Evansville. The Evansville, Henderson & Owensboro Railway recently began the operation of a line between Evansville, Ind., and Henderson, Ky., its cars being ferried over the Ohio River. The company also operates in Henderson. The deed filed by this company leases its lines, bridges, buildings and boat to the Evansville Railway.

Lake Erie, Bowling Green & Napoleon Railroad, Bowling Green, Ohio.—On May 17 the Union Trust Company of Detroit instituted foreclosure proceedings in the United States District Court at Detroit against the Lake Erie, Bowling Green & Napoleon Railway. The amount due on the first mortgage 5 per cent bonds of 1903 is stated as $429,500.

Lehigh Valley Transit Company, Allentown, Pa.—The stockholders of the Lehigh Valley Transit Company are to vote on June 12, 1913, on a proposition to increase the present indebtedness in connection with the purchase of the stock of the Easton Consolidated Electric Company, noted in the Electric Railway Journal of April 1, 1913, and for other purposes. The agreement for the purchase of the 30,000 shares of the Easton Consolidated Electric Company stock called for the issuance in payment therefor of $30.33 per share in 6 per cent collateral trust bonds, aggregating, if the entire stock is acquired, $909,900 of a possible $1,000,000 issue.

Massachusetts Northern Railways, Greenfield, Mass.—A statement has been filed by the Massachusetts Northern Railways with the Massachusetts Railroad Commission relative to the number of shares in street railway companies owned or controlled as follows: Athol & Orange Street Railway, 4000 shares; Connecticut Valley Street Railway, 4891 shares; Concord, Maynard & Hudson Street Railway, 2219 shares. In March, 1913, the Athol & Orange Street Railway was authorized by the commission to issue $185,000 of common stock in exchange share for share for the capital stock of the Gardner, Westminster & Fitchburg Street Railway and 905 shares of common stock at par and 1500 shares of 6 per cent cumulative preferred stock to provide in part for indebtedness incurred in purchase of the Massachusetts Street Railway. On May 3 the name of the Athol & Orange line was changed to the Northern Massachusetts Street Railway Company. Application is also pending to enable that company to make an issue of $500,000 of first and refunding bonds, of which $255,000 is to take up the floating debt and $245,000 to refund $60,000 bonds due Jan. 1, 1915, and $185,000 Gardner, Westminster & Fitchburg bonds due Feb. 1, 1920.

Mexico, Santa Fé & Perry Traction Company, Mexico, Mo.—The property of the Mexico, Santa Fé & Perry Traction Company has been sold at receiver's sale for $37,500 to D. Bates, W. W. Botts, Shan Brown, Baxter Guthrie, Ashby Botts and William Munday. The transaction covers 13 miles of railroad and equipment, besides 60 miles of right-of-way for extensions and $20,000 of subscriptions which are said to be collectible for the construction of the proposed road. W. W. Botts was treasurer of the company, of which M. Crum was president. The line was designed to connect Mexico, Parry and Hannibal, Mo.

New Orleans Railway & Light Company, New Orleans, La.—Bertron, Griscom & Company, New York, N. Y., and E. H. Rollins & Sons, Boston, Mass., are offering at 99½ and interest, to yield more than 6.15 per cent, the unsold portion of the present issue of $2,500,000 of three-year 6 per cent gold debentures of the New Orleans Railway & Light Company, one-half of the issue having been sold abroad. The debentures are dated June 1, 1913, and are due June 1, 1916, but are redeemable at 101 and interest on any interest date, par value $1,000 and $500. They are guaranteed as to principal and interest by indorsement by the American Cities Company, which owns 96 per cent of the common stock and 87 per cent of the preferred stock of the New Orleans Railway & Light Company. The authorized amount of the debentures is $4,000,000, of which $2,500,000 is to be issued at once to pay existing construction indebtedness and to provide about $1,000,000 for new construction work during 1913. The remaining $1,500,000 is reserved to meet the anticipated construction requirements of 1914 and 1915. The indenture under which these debentures are issued forbids during the life of these debentures (1) any new mortgage, except purchase-money mortgages, unless these debentures be secured thereby as fully as any obligations issued thereunder; (2) any other indebtedness except for current operating accounts without the written consent of the holders of two-thirds of the outstanding debentures, except that the company may issue not over $1,975,000 additional refunding and general lien 5 per cent bonds as collateral for a loan, but may not sell them to the public.

New York, Auburn & Lansing Railroad, Auburn, N. Y.—The receivers of the New York, Auburn & Lansing Railroad have received permission to issue $120,000 of receivers' certificates to purchase and improve the power plant at the Remington Salt Works. Of the proceeds $85,000 will be used to purchase the plant and the remainder for improvements.

Oskaloosa Traction & Light Company, Oskaloosa, Ia.—W. B. McKinley, president of the Illinois Traction System, Champaign, Ill., has exercised the option which he took recently on the property of the Oskaloosa Traction & Light Company. He will take over the property on June 1, 1913.

Philadelphia (Pa.) Rapid Transit Company.—E. T. Stotesbury, chairman of the board of the Philadelphia Rapid Transit Company, is quoted as saying that the plan of financing as contemplated by that company provides for the sale of $4,500,000 of 5 per cent sinking fund bonds due 1962, with the option to the company, extending over a period of two and a half years, to repurchase the bonds should the company desire to make other use of them during the said period.

Plymouth & Sandwich Street Railway, Plymouth, Mass.—The Massachusetts Railroad Commissioners on May 27, 1913, authorized the Plymouth & Sandwich Street Railway to issue 1400 shares of common and 570 shares of 6 per cent preferred stock at $100 per share. The proceeds of 270 shares of the preferred are to be used to pay the floating debt and the remainder of the stock to defray the cost of building and equipping extensions of the line.

Springfield, Clear Lake & Rochester Interurban Railway, Springfield, Ill.—Judge James A. Creighton, of the Sangamon County Circuit Court at Springfield, Ill., has confirmed the decree of Master in Chancery Pfeiffer that the Springfield, Clear Lake & Rochester Interurban Railway should be sold at auction, as stated in the Electric Railway Journal of May 17, 1913, page 909. According to the decree, workmen employed on the road six months before and six months after the filing of the foreclosure proceedings have prior liens on the sale.

Stockton Terminal & Eastern Railroad Company, Stockton, Cal.—The California Railroad Commission recently sanctioned the issue of $345,000 of first mortgage 6 per cent bonds by the Stockton Terminal & Eastern Railroad, partly to be sold and partly for collateral. The total authorized issue is $500,000, dated April 1, 1911, and due April 1, 1941, but redeemable at any time in any amount of 110, par value $1,000 and $500, interest April and October. The proceeds, it is stated, will be used to extend the railway from its present terminus in Stockton to Stockton Channel, to improve the line from Stockton to Bellota and to extend the railway from Bellota to Jenny Lind, and for equipment.

United Properties Company, Oakland, Cal.—The committee appointed to take charge of the United Properties Company, noted in the Electric Railway Journal of May 24, 1913, requested by a letter mailed on May 14, 1913, that all the creditors of F. M. Smith deposit their notes, claims and securities, including the collateral therefor, with the Mercantile Trust Company, San Francisco, before May 25, 1913. The substance of the committee's report is as follows: "The committee finds, after such investigation as it has been able to make, that the properties of many of the companies in which F. M. Smith was a large stockholder are of great value, but that they require careful administration and in some instances further financing to prevent them from being sacrificed. Any attempt at this time on the part of individual pledge holders to realize upon the securities held by them could not but result in making the securities comparatively worthless and bringing disaster upon all concerned. There is practically no market for these securities at the present time, and unless they can be handled as a body it is not likely that there will be any [adequate] market for them in the future. As soon as the success of the plan is assured, interest will be paid to you on your notes at the rate of 6 per cent per annum; otherwise your notes and collateral will be returned to you.

In any event there will be applied upon your notes, while held by the trust company, all dividends or interest which may be collected on account of the collateral deposited by you, and when this collateral is disposed of, which will be done as rapidly as the committee can safely do so, you will receive all of the proceeds realized from the collateral so deposited up to the amount of your claim." National Bank Examiner H. N. Norris and Superintendent of Banks W. R. Williams advise creditors to co-operate with the committee, Mr. Norris adding: "The assets are of great intrinsic value, and ample, under reasonably favorable conditions, to pay all creditors and leave a large surplus."

United Railways & Electric Company, Baltimore, Md.—There has been listed on the Philadelphia Stock Exchange $19,568,800 of common stock, par value $50, full-paid and non-assessable, and $110,000 additional first consolidated 4 per cent gold bonds, due March 1, 1941, of the United Railways & Electric Company.

Wheeling Traction Company, Wheeling, W. Va.—The shareholders of the Wheeling Traction Company on May 17, 1913, authorized a new $10,000,000 mortgage to provide for refunding the present $2,500,000 of bonds and for additions and extensions.

Dividends Declared

Chicago (Ill.) Elevated Railways, quarterly, $1.50, preferred participating shares.

Norfolk Railway & Light Company, Norfolk, Va., 3 per cent.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1 per cent, common.

Virginia Railway & Power Company, Richmond, Va., quarterly, 2½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

JOPLIN & PITTSBURG RAILWAY, PITTSBURG, KAN.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. April	'13	$45,594	*$28,357	$17,237	$12,542	$4,695
1 " "	'12	43,315	*27,000	16,315	12,911	3,404
12 " "	'13	552,157	*324,912	227,245	151,263	75,982
12 " "	'12	486,964	*285,276	201,688	154,327	47,361

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1 mo. March	'13	$93,289	*$62,921	$30,367	$34,954	†$4,587
1 " "	'12	92,120	*58,945	33,174	34,758	†1,594
3 " "	'13	282,342	*187,697	94,645	104,829	†10,184
3 " "	'12	261,391	*170,795	90,595	104,193	†13,598

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE

1 mo. March	'13	$48,595	*$32,882	$15,713	$14,596	$1,117
1 " "	'12	42,510	*31,427	11,183	14,447	†3,264
12 " "	'13	637,244	*390,124	247,120	173,296	73,824
12 " "	'12	596,384	*372,496	223,888	170,063	53,825

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1 mo. March	'13	$174,934	*$106,831	$68,103	$37,632	$30,471
1 " "	'12	168,647	*101,156	67,491	34,957	32,534
12 " "	'13	2,112,525	*1,211,068	901,457	442,034	459,423
12 " "	'12	1,988,258	*1,146,602	841,756	408,904	432,852

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1 mo. March	'13	$227,146	*$147,406	$79,739	$45,214	$34,525
1 " "	'12	215,888	*125,278	90,610	43,820	46,790
3 " "	'13	687,181	*427,785	259,396	135,082	124,313
3 " "	'12	628,487	*367,370	256,117	131,466	124,651

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1 mo. March	'13	$544,895	$276,148	$268,748	$160,998	$107,750
1 " "	'12	543,138	285,050	258,088	131,153	126,935
12 " "	'13	6,677,595	3,295,576	3,382,019	1,820,884	1,561,135
12 " "	'12	6,424,341	3,144,975	3,279,366	1,546,641	1,732,725

PORTLAND (MAINE) RAILROAD

1 mo. March	'13	$73,943	$60,931	$13,012	$10,298	$2,714
1 " "	'12	68,030	59,011	9,019	10,166	†1,147
12 " "	'13	997,252	698,774	298,478	123,381	175,097
12 " "	'12	965,334	721,092	244,242	113,294	130,948

ST. JOSEPH RAILWAY, LIGHT & POWER COMPANY, ST. JOSEPH, MO.

1 mo. March	'13	$103,807	$55,650	$48,157	$20,198	$27,959
1 " "	'12	94,320	52,202	42,118	19,710	22,408
12 " "	'13	1,198,143	678,133	520,010	237,448	282,562
12 " "	'12	1,126,004	686,968	439,036	232,703	206,333

SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS, OAKLAND, CAL.

1 mo. March	'13	$402,140	$255,972	$146,168	$99,772	$46,396
9 " "	'13	3,484,184	2,147,207	1,336,977	905,716	431,260

*Includes taxes. †Deficit.

Traffic and Transportation

Safety First—First Safety

T. P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., contributed to the current issue of the *Interborough Bulletin*, published in the interest of the employees, an article "Safety First—First Safety" in part as follows:

"The habit of exercising care and diligence is a primary imperative duty which each employee owes to himself, his family, his fellow-employee and his family, his employer, the traveling public and to society.

"To be careless, thoughtless or reckless inevitably means injury and sorrow, not only to one's self but to those most dear to him, and not infrequently to others as well.

"One of the greatest risks the 'careful' man runs is the possibility of injury resulting from the acts of a 'careless' fellow-worker. Therefore, when the 'careless' man will not endeavor to do better and mend his ways, he should, for the protection of all, be weeded out of the service, and those most directly and vitally concerned in this process of elimination are his fellow-workers.

"Every accident is a 'notice' that something is wrong with methods, material or man and should be investigated at once to ascertain the cause and necessary remedy. To accomplish this requires the full and hearty co-operation of employees among themselves and with officials of the company as well. Nothing should be overlooked—everything should be reported, with suggestions looking toward possible improvement.

"If at all times we will strive to do and encourage others to do the safe and sane thing, we shall add to the sum of human happiness by subtracting from the sum of human woe, and all-sufficient will be our reward, if through this united effort, gladness, not sorrow, may live in the hearts of our fellow-workers.

"Remember always that:

"In the transportation business 'human failures' are the chief cause of accidents and injuries. The remedy is greater caution in the individual.

"No one has the right to take a chance. The other fellow may have to suffer the consequences.

"Because an accident has never happened is no reason preventing it ever happening.

"It is an easy matter to adjust a knuckle the second time, but a mangled or mutilated hand or foot can never be replaced.

"A minute of good judgment may frequently be worth many times a day of energy.

"Through the careful use of good judgment we develop efficiency, and upon efficiency depends the success and happiness of all.

"Great is the power of repetition. It is hoped, therefore, employees will read, re-read and thoroughly digest the good advice recently issued in circular form to employees on the 'safety first' habit.

"To further instill 'safety first' ideas in each other, let us talk 'safety' at every opportunity and freely discuss among ourselves recent accidents and causes of injury and consider methods for their prevention."

Increase in Wages in Montreal.—The Montreal (Que.) Tramways has increased the pay of its motormen and conductors 1 cent an hour.

Increase in Wages in Kewanee.—Employees of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., have obtained an increase in wages from 22 cents to 26 cents an hour.

Prizes for Neat Stations.—Prizes aggregating $60 have been offered by W. B. McKinley, president of the company, for the neatest appearing stations and substations along the Illinois Traction System, Peoria, Ill.

Through Freight Between Canton and Peoria.—The Illinois Central Electric Railway, Canton, Ill., and the Minneapolis & St. Louis Railway, a steam railroad, contemplate establishing through freight service between Canton and Peoria by way of Farmington.

Complaint to Ohio Public Service Commission.—T. C. Davis, city solicitor of Massillon, has filed complaint with the Public Service Commission of Ohio to the effect that the cars operated by the Northern Ohio Traction & Light Company on the local line in that city are unsafe and that the terms of the franchise agreement between the city and the company have been violated by the company.

Freight Service Out of Syracuse.—Sixteen freight cars now leave Syracuse, N. Y., daily, except Sunday, over six interurban electric railways. There are about the same number of incoming freight cars over the same lines. Freight which originates in Syracuse is carried direct by the electric railways as far as Rochester, Little Falls, Oswego and Auburn, and there is a transfer service extending to Cooperstown and Oneonta.

Fare Case Before United States Supreme Court.—The arguments have been heard before the Supreme Court at Washington, D. C., in the suit brought by the Portland Railway, Light & Power Company, Portland, Ore., to set aside the rates of fare fixed by the Railroad Commission to be charged by the company on its so-called Milwaukee and Oak Grove lines. The District and the Supreme Courts of Oregon sustained the rates as fixed by the commission.

Elgin Safety Campaign Broadened.—The "safety first" campaign in Elgin, Ill., conducted by H. B. Adams, claim agent of the Aurora, Elgin & Chicago Railroad, has been broadened. The Illinois Watch Case Company and the Young Woman's Christian Association have requested that addresses be made at those places. The principal of one of the schools in Elgin had her pupils write essays on the talk delivered by Mr. Adams, and these papers have been forwarded to the claim agent.

Increase in Wages by Tri-City Railway.—Mechanics of the Tri-City Railway employed at the shops in Davenport, Ia., the carhouse in Davenport, the shops in Rock Island and at the Davenport and Muscatine shops in Muscatine have received an increase of 10 per cent in pay, effective on June 1, 1913. Motormen and conductors of the company affiliated with the union are asking an increase of 4 cents per hour over the present scale of 26 cents. The present contract affecting 350 men expires on June 1, 1913.

Proposals for Relief of Congestion in Montreal.—As the result of a conference with the Board of Control, the directors of the Montreal (Que.) Tramways have made proposals intended to afford immediate traffic relief and have suggested that permanent and elastic plans be drawn later to provide for the future growth of the city. The company asks permission to re-route several lines in the down-town district and has suggested a number of new routes in the northeastern section. The plans also provide for three new routes to accommodate St. Catherine Street traffic.

Activities of Public Service Corporation in Employees' Interest.—An illustrated feature article was published in the Newark *News* of May 18, 1913, under the caption "How Public Service Is Looking After Its Men as Well as Its Cars." The article dealt with the methods adopted by the Public Service Corporation of New Jersey, Newark, N. J., to further the interests of its employees, and was illustrated with half-tones showing a lunch counter in one of the carhouses, the theater used by the employees, the new athletic field for the men, a typical pool, card and reading room for the railway employees and a view in one of the machine shops and one in a carhouse.

Strawberry Specials.—The Louisville & Northern Railway & Lighting Company, operating north from New Albany, Ind., has put its "strawberry" specials into service and has captured practically all of the business going into Indianapolis by reason of the conveniences which it has to offer, although the rates are the same as those charged by the old-line express companies. The express cars taking care of the strawberry business stop at numerous points in the growing district and enable the shippers of strawberries to load their fruit with a minimum of hauling from the field, while at the same time the cars stop in front of the commission houses in Indianapolis. The express cars leave New Albany at 9 p. m. and arrive at Indianapolis at 1 a. m. Four cars, holding 1000 crates each, are being run.

Kansas City-St. Joseph Fares.—Chairman Atkinson of the Missouri Public Utility Commission is quoted as follows in regard to the rates now in force over the Kansas City, Clay County & St. Joseph Railway: "The rates are apparently fair. If they should prove to be unjust either to the public or to the company, the matter can easily be remedied by an appeal to the commission. The necessary action can be taken at any time. It now seems, however, that fares charged are such as to do justice to the public and to permit the company to make a fair return upon its investment. Those are the two vital points to be considered. The commission is not a destructive but a constructive body and its aim is to safeguard the interests of the public, at the same time encouraging capital to find investment in Missouri."

"The World's Greatest Traffic Problem."—Isaac F. Marcosson has contributed to *Munsey* for June, 1913, an article, "The World's Greatest Traffic Problem," dealing with the handling of traffic in New York City. The text is accompanied by reproductions of photographs showing traffic congestion, subway work in progress, crowded cars and one of the last horse cars. Portraits are also published of Edward E. McCall, chairman of the Public Service Commission of the First District; William R. Willcox, formerly chairman of the Public Service Commission of the First District; Mayor Gaynor, Comptroller Prendergast, Borough President McAneny, President Shonts of the Interborough Rapid Transit Company, President Williams of the Brooklyn Rapid Transit Company and Vice-president and General Manager Hedley of the Interborough Rapid Transit Company.

Transfer Inquiry in Washington, D. C.—The Public Utilities Commission of the District of Columbia has decided formally to investigate the alleged failure of the Capital Traction Company and Washington Railway & Electric Company to enter into an arrangement, as prescribed by Congress, with the Metropolitan Coach Company respecting the issuance of reciprocal transfers between the lines of the three concerns at Fifteenth Street and Pennsylvania and New York Avenues Northwest. Legal proceedings to test the constitutionality of the law have already been instituted by the Commissioners of the District of Columbia, but the commission will conduct an independent investigation. A hearing on the complaint of the Metropolitan Coach Company, which was filed with the commission some time ago, will be held on June 2, 1913.

President Bancroft on Hours of Labor.—William A. Bancroft, president of the Boston (Mass.) Elevated Railway, has addressed each member of the Massachusetts Legislature in a pamphlet discussing the proposed "nine-hours-in-eleven bill" offered by labor interests at the present session, and pointing out the superiority of House bill No. 2476, reported by the committee on street railways in its stead. The latter bill provides that a day's work for all car service employees shall be arranged on the basis of nine hours' platform time, with a leeway of half an hour at additional pay; that as many days' work of approximately nine hours shall be arranged to be performed within twelve consecutive hours as are possible in view of the number of hours and trips necessary to care properly for the traffic; that work which cannot be so arranged shall be performed within fourteen consecutive hours, and that the Railroad Commission shall, if necessary, fix any schedule which in the judgment of the men might be arranged to show more runs to be completed within twelve hours. General Bancroft points out that last year's act permitted the nine hours' platform work of a man to be distributed with his consent over a period of sixteen hours. The new bill (House 2476) provides an unbroken rest period of ten hours instead of eight hours and is more favorable to the men than those prescribed by law in any other State or established in any important city. The communication further outlines the hours of labor in force in New York, Cleveland, Chicago and Pittsburgh; explains the inability of the "nine-hours-in-eleven" bill to meet the traffic conditions in connection with the handling of morning and evening peaks; states that 1700 additional men would have to be added by the Boston Elevated Railway if the labor bill should pass, and contends that the taking of the whole matter to the Legislature is inconsistent with the agreement between the employees and the company made last summer.

Personal Mention

Mr. J. Antonisen, city engineer of Moose Jaw, Saskatchewan, Can., has been appointed superintendent of the Brandon (Man.) Municipal Street Railway.

Mr. George F. Yeatman, for many years cashier of the Nashville Railway & Light Company, Nashville, Tenn., has resigned to become a special agent of the Germania Life Insurance Company in Nashville.

Mr. Henry G. Pearce, of the Standard Steel Works Company, Philadelphia, Pa., has been appointed chairman of the entertainment committee for the 1913 convention of the American Electric Railway Association, to be held at Atlantic City.

Mr. Warren C. Earle, who has been with similar boards in several states and in practical work with several railroads in the United States, has been appointed chief engineer of the California State Railroad Commission, vice Mr. R. A. Thompson, resigned.

Mr. William W. S. Butler, vice-president and general manager of the Western States Gas & Electric Company of California, Stockton, Cal., since its formation, has resigned. Mr. Butler was formerly general manager and engineer of the Newport News & Old Point Railway & Electric Company.

Mr. C. W. Kellogg has been appointed general manager of the Beaumont and Port Arthur properties of Stone & Webster, Boston, Mass., which include the lighting plants at Beaumont and Port Arthur, the electric railway system at Port Arthur and the interurban railway being constructed between Beaumont and Port Arthur by the Jefferson County Traction Company.

Mr. John W. Howley, who has been clerk at the East Weymouth carhouse of the Bay State Street Railway, Boston, Mass., for several years, has been appointed to the position of superintendent of the Bay State Street Railway at East Weymouth to succeed Mr. Timothy J. Donahue, whose appointment as superintendent of the Newport division of the company is referred to elsewhere in this column.

Mr. Edwin W. Winter, formerly president of the Brooklyn (N. Y.) Rapid Transit Company, has been appointed one of the receivers of the Chicago & Eastern Illinois Railroad, which is controlled by the St. Louis & San Francisco Railroad, placed in the hands of receivers on May 27. Mr. Winter entered steam railroad service in 1867 and continued in that work until 1902, when he was elected president of the Brooklyn Rapid Transit Company.

Mr. J. M. McElroy, general manager of the Manchester (Eng.) Corporation Tramways, and Mr. Henry Mattison, engineer of way of the same system, are in this country to inspect American electric railway practice and also to study the methods of caring for traffic congestion, which is a subject of growing interest in Manchester. They expect to spend about a month here and will visit a number of the important cities in the Eastern and Central States and in Canada.

Mr. A. Merritt Taylor has been appointed by Mayor Blankenburg of Philadelphia, Pa., director of the new department of transit recently created for Philadelphia by the Legislature. His salary will be $10,000 a year and he will assume office on July 1. Mr. Taylor has been serving for the last year without pay as the head of a commission engaged in studying the city's transit needs. In a recent report to the Mayor he outlined a comprehensive plan for the construction of additional subway and elevated lines.

Mr. Timothy J. Donahue, who has been connected with the East Weymouth division of the Bay State Street Railway, Boston, Mass., has been transferred to the Newport division of the company as superintendent to succeed Mr. C. L. Bisbee, who in turn succeeded the late A. E. Holmes as superintendent of the Fall River division. Mr. Donahue became connected with the Bay State Street Railway at East Weymouth in 1905. Previous to his appointment at East Weymouth he was employed by the company on its North Abington division.

Mr. S. J. Kehoe has resigned as superintendent of the Norwich & Westerly Traction Company, Norwich, Conn., to become superintendent of the Norwich Gas & Electric Company, Norwich, Conn. Mr. Kehoe has been superintendent of the Norwich & Westerly Traction Company since March, 1912. Previous to that he was master mechanic of the company for six years. Mr. Kehoe was also connected with the Michigan United Railways, Lansing, Mich., and the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

Mr. George H. Green has been appointed general agent of the Northern Texas Traction Company, with headquarters in the interurban station of the Northern Texas Traction Company at Dallas, Tex. He will devote his time to passenger traffic and other matters connected with the operation of the interurban and Oak Cliff lines of the company and fill a position which the company has long contemplated creating. Mr. Green has for the last fourteen years been United States marshal for the Northern District of Texas, with residence in Dallas.

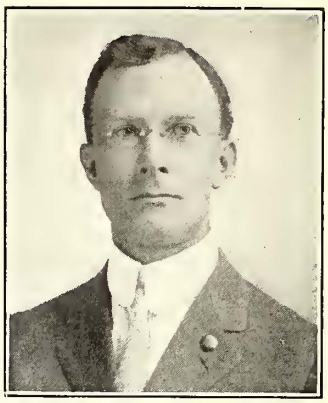
Mr. J. M. Read, who has been appointed superintendent of the Ogden (Utah) Rapid Transit Company, has been assistant superintendent of the company since September, 1911. Previous to becoming connected with the Ogden Rapid Transit Company Mr. Read was with the Utah Light & Railway Company, Salt Lake City, Utah, which he served for four years in the capacity of dispatcher. He succeeds Mr. P. D. Kline as superintendent of the Ogden Rapid Transit Company, Mr. Kline, as previously noted in the ELECTRIC RAILWAY JOURNAL, having been appointed general manager of the company.

Mr. Harry E. Vordermark, formerly auditor of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been elected secretary of the company to succeed Mr. Henry Rainey, Philadelphia, Pa., who has been elected assistant secretary of the company. Messrs. John J. Collier, Philip L. Saltonstall, Robert W. Watson, E. B. Robinette and Henry Rainey, who resigned as directors of the Fort Wayne & Northern Indiana Traction Company, have been succeeded by Messrs. S. L. Morris, Sam W. Greenland, Harry E. Vordermark, Frederick H. Schmidt and J. J. Brennan, all of Fort Wayne, Ind.

Mr. Albert S. Reed, who has been connected with the Binghamton (N. Y.) Railway with headquarters in Endicott, a suburb of Binghamton, has resigned. Mr. Reed was formerly manager of the sales department for the Rutland Railway, Light & Power Company, Rutland, Vt., and he has resumed work with that corporation as manager of new business of the eastern territory of the company. He will also act as assistant to Mr. W. H. Lawson, superintendent of the gas department. Mr. Harry L. Edwards, who has recently been in charge of new business for the company, will henceforth be in charge of that work for the Western Vermont Power & Light Company, which is affiliated with the Rutland Railway, Light & Power Company.

Mr. James M. Barrett, who was elected president of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., at the meeting of the board of directors on April 30, 1913, to succeed Mr. J. Levering Jones, Philadelphia, Pa., resigned, was born on a farm in Lasalle County, Ill., on Feb. 7, 1852. He entered the University of Michigan in 1871 and was graduated in the academic department in 1875. He studied law at Chicago and Princeton, Ill., and afterward at Fort Wayne, Ind., and was admitted to the bar in 1876. In 1881 Mr. Barrett was elected a director and appointed counsel for the local street railway system in Fort Wayne, and thereafter he continued as director and counsel until the organization of the Fort Wayne & Wabash Valley Traction Company, which acquired the local street railway systems in Fort Wayne and the interurban lines running from Fort Wayne to Peru and Lafayette and from Fort Wayne to Bluffton, Ind. He was then appointed general counsel for the Wabash Valley company and continued as such until its property and franchises were acquired by the Fort Wayne & Northern Indiana Traction Company, after which he became vice-president, director and general counsel of that company until his recent election as president. Mr. Barrett is one of the most prominent lawyers of the State. He served as a member of the Indiana Senate in the sessions of 1887 and 1889 and was a trustee of Purdue University, Lafayette, Ind., for fourteen years.

Mr. F. E. Bowman, who was elected president of the Gas, Electric & Street Railway Association of Oklahoma at the meeting held in Oklahoma City on May 6-8, 1913, is vice-president, treasurer and manager of the Ada Electric & Gas Company, Ada, Okla. Mr. Bowman was born in Wooster, Ohio, and entered the electrical field in 1892 as bookkeeper and cashier with the Huntington Light & Fuel Company, Huntington, Ind., which generated electricity and produced artificial gas, natural gas and petroleum. He advanced through various positions with the Huntington Light & Fuel Company to the office of treasurer of the company. Five years ago he resigned from the Huntington Light & Fuel Company to accept his present position as vice-president, treasurer and manager of the Ada Electric & Gas Company. The company with which Mr. Bowman is now connected serves Ada, which has a population of 6000, and the surrounding territory.



F. E. Bowman

Mr. Alfred H. Lovett has been appointed general agent of the traffic department of the Iowa & Illinois Railway and the Davenport & Muscatine Railway, Davenport, Ia., reporting to Mr. P. P. Crafts, general traffic manager, and Mr. George M. Cummins, freight traffic manager. Mr. Lovett was born at Barnes Corners, N. Y., on Dec. 2, 1875. He learned telegraphy on the Rome, Watertown & Ogdensburg Railroad in 1889. In 1892 Mr. Lovett went to Davenport with his parents and was employed by the Western Union Telegraph Company as an operator and studied at the public schools in Davenport. Later he attended Pillsbury Academy, Owatonna, Minn., and Colgate University, Hamilton, N. Y., where he studied in the preparatory department during 1898 and 1899. He was next employed by the Long Island Railroad near New York for three years and by the Atchison, Topeka & Santa Fé Railway in Kansas in 1901 and 1902 as operator, towerman and ticket agent. In March, 1903, he entered the employ of the Chicago, Rock Island & Pacific Railway in Chicago as stenographer to Mr. L. M. Allen, then general passenger agent of the lines east of the Missouri River. He worked for the last-mentioned company in various sub-departments until March 1, 1906, when he was appointed city passenger agent at Davenport. He was subsequently appointed traveling passenger agent of the Chicago, Rock Island & Pacific Railway, with headquarters at Davenport, and later was appointed contracting freight agent at Davenport, in which capacity he continued until appointed to the Iowa & Illinois Railway and the Davenport & Muscatine Railway on May 19, 1913.

Mr. R. W. Perkins, whose election as president of the Shore Line Electric Railway, Norwich, Conn., was noted recently in the Electric Railway Journal, was formerly treasurer and general manager of the Norwich & Westerly Traction Company. Mr. Perkins has had a general training in commercial, manufacturing and banking lines, but his railroad career has been comparatively brief. Upon the election of Mr. Perkins as executive head of the Shore Line Electric Railway the announcement was made that Norwich is to be the center from which all the so-called Plant lines are to be operated. The properties that have come under one management through the consolidation are the Shore Line Electric Railway with its western terminus in New Haven, extending east along the shore to Saybrook Junction and north to Deep River; the New London & East Lyme Street Railway, operating from New London to East Lyme and Niantic and building so as to connect with the Shore Line Electric Railway and make possible through service from New Haven to New London, and the properties of the Connecticut Company known as the New London division, which include the New London city lines, the Montville Street Railway between New London and Norwich, the Norwich city lines, the line from Norwich through South Windham and Willimantic to South Coventry, also the electric service on the Norwich & Worcester division of the New York, New Haven & Hartford Railroad between Tafts, Jewett City, Plainfield and Central Village, and the electric railways to Wauregan, Danielson, Dayville, Putnam and West Thompson with connections through to Worcester. Combining these with the Norwich & Westerly Traction Company, which operates its own line from Norwich through Preston, Ledyard, North Stonington and Westerly, R. I., to Watch Hill and Weekapaug on the Atlantic Ocean, and from Westerly east to Ashaway, R. I., west along Fisher's Island and south through Pawcatuck, Stonington, Mystic, Old Mystic, Noank, Midway and Groton to New London, rounds out a system of about 240 miles, embracing all of the eastern end of Connecticut and a portion of western Rhode Island. Mr. Perkins was selected as the executive head of the operating company because of the excellent results accomplished by him in the reorganization and upbuilding of the Norwich & Westerly Traction Company. When this property was purchased by the bondholders' committee, in July, 1911, Mr. Perkins was elected treasurer and general manager by the new owners. The Norwich & Westerly Traction Company has since taken over by purchase the Pawcatuck Valley Street Railway and purchased all of the common stock of the Groton & Stonington Street Railway.

OBITUARY

Edward Glavin, of the Boston (Mass.) Elevated Railway, died on May 22, 1913, at the age of sixty-three. Mr. Glavin had been in the service of the company for forty-six years and was the only man in the employ of the company wearing nine gold chevrons, each of which represented five years' service. For the last twenty-five years he was a starter. He was well known to the traveling public, his post being outside the North Station, one of the busiest points in the city.

George Glover Crocker is dead. Mr. Crocker was born in Boston in 1843 and was graduated from Harvard in 1864, where he later took the degree of LL. B. in 1866 and of M. A. in 1867. From 1887 to 1892 he was chairman of the Massachusetts Board of Railroad Commissioners, and from 1894 to 1899 was chairman of the Boston Transit Commission, which supervised all of Boston's elevated and subway construction. From 1909 to 1910 he was chairman of the Joint Board on Metropolitan Improvements. He was a director of the Samson Cordage Works.

According to figures made public by the National Highways Protective Society, traffic accidents in New Jersey for the first four months of 1913 showed a gratifying decrease from the figures for the same period of last year. From Jan. 1 to April 30, 1913, automobiles killed twenty-three and injured 108. For the same months of 1912 the figures were twenty-three and 189. The electric railways killed nine and injured forty-nine this year against thirteen killed and seventy-three injured last year, and the figures for wagons were four killed and twenty-two injured against five killed and twenty-four injured for the same months of 1912. Children sixteen years of age or less were seven of those killed and thirty-two of those injured by automobiles, none of the killed and six of the injured by electric railways, and three of the killed and five of the injured by wagons. Automobile accidents include those due to motor cycles, and wagon accidents those caused by runaways. These figures show, when compared with those for New York State, inclusive of New York City:

	Automobiles		Trolleys		Wagons	
	Killed	Injured	Killed	Injured	Killed	Injured
New Jersey	23	108	9	49	4	22
New York	99	461	64	256	38	138

The populations of the two States in 1910 were approximately: New Jersey, 2,500,000; New York, 9,100,000. Using this as a basis for comparison, the number of fatal accidents per million of population, for the two States for the first four months of this year is, for all classes of traffic:

	New York	New Jersey
Automobiles	11.0	9.0
Electric railways	7.0	3.6
Wagons	4.1	1.6

Construction News

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

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

RECENT INCORPORATIONS

***Peoria, Galesburg & Western Railroad, Peoria, Ill.**—Incorporated in Illinois to build an electric railway from Peoria to Galesburg. Capital stock, $5,000. Headquarters, Peoria. Incorporators: William T. Irwin, Clifford Ireland, John W. McDowell, George J. Jobst and William M. Allen, all of Peoria.

Geneva, Seneca Falls & Auburn Railroad, Seneca Falls, N. Y.—Incorporated in New York on May 28, 1913, to succeed the Geneva & Auburn Railway, plans for the reorganization of which are now before the Public Service Commission of the Second District. Capital stock, $450,000.

***Devil's Lake & Chautauqua Electric Railway, Devil's Lake, N. D.**—Incorporated in North Dakota to build an electric railway between Devil's Lake and Chautauqua. Capital stock, $50,000. Incorporators: C. A. Stotiar, W. H. Horton and W. E. Hocking, all of Devil's Lake.

***Memphis & Lake View Railway, Memphis, Tenn.**—Incorporated in Tennessee presumably to succeed the Lake View Traction Company. Capital stock, $50,000. Incorporators: T. H. Tutwiller, Memphis; L. E. Wright and L. P. Niles.

FRANCHISES

Norwood, Ala.—I. C. Beatty has received a franchise for a line in Norwood. [E. R. J., March 29, '13.]

Little Rock, Ark.—The Little Rock, Pine Bluff & Eastern Traction Company has received a fifty-year franchise in Little Rock and permission to use the free bridge.

Burnaby, B. C.—The British Columbia Electric Railway has received a thirty-six-year franchise in Burnaby. The Council has petitioned the company to extend its lines 6 miles into Port Moody. Work will soon be begun on an extension from Vancouver to Burnaby, 2 miles.

Glendale, Cal.—Sealed bids will be received up to June 9 by the Board of Trustees of Glendale for a fifty-year franchise for an electric railway in Glendale.

Los Angeles, Cal.—The Pacific Electric Railway has asked for a twenty-one-year franchise for an extension of the Hollywood line in Los Angeles.

***Santa Barbara, Cal.**—Sealed bids will be received by the City Council up to June 12 for the purchase of a fifty-year franchise for an electric railway in Santa Barbara.

San José, Cal.—The Peninsula Railway has asked for a franchise to extend its line in San José to the Toyon station.

Vallejo, Cal.—The Northern Electric Railway has asked the Railroad Commission of California for permission to construct its lines at grade over highways in Solano County and on certain streets in Vallejo.

Galesburg, Ill.—The Peoria, Canton & Galesburg Railway will apply for a franchise to construct an electric railway in Galesburg. Horace Clark, president. [E. R. J., May 17, '13.]

Taylorville, Ill.—The Decatur, Sullivan & Mattoon Transit Company has asked the Council for a new fifty-year franchise to build an interurban railway on Franklin Street. John G. Thode, Mattoon, secretary. [E. R. J., March 22, '13.]

Bettendorf, Ia.—The Tri-City Railway, Davenport, has asked the Council for a franchise on State Street in Bettendorf.

Helena, Mont.—The Helena Light & Railway Company will extend its line across the bridge to East Helena if the Council will permit a straight fare of 10 cents on all cars to East Helena.

Lincoln, Neb.—The Lincoln Traction Company has received a franchise to extend its Tenth Street line in Lincoln.

El Paso, Tex.—The El Paso Electric Railway will ask the Council for a thirty-year franchise to extend its lines over certain streets in El Paso.

Tacoma, Wash.—The Seattle-Tacoma-Olympia Railway, Seattle, has received a franchise from the Council to build a temporary system on local tideflats in Tacoma. [E. R. J., Sept. 28, '12.]

Charleston, W. Va.—The Charleston, Parkersburg & Northern Railroad, Parkersburg, has received a franchise from the County Court from the western limits of Charleston to the Jackson County line, via Sissonville. [E. R. J., May 24, '13.]

TRACK AND ROADWAY

Birmingham & Chattanooga Railroad, Birmingham, Ala.—Surveys have been completed and construction will be begun by this company during the summer on its 147-mile electric railway to connect Birmingham and Chattanooga via Oneonta and Boaz, Ala., and Wanhatchie, Tenn. The railway will be built for passenger and freight service. The grades will nowhere be more than 1 per cent and 85-lb. rails will be used. A bridge will be built across the Tennessee River near Chattanooga. W. W. Shortridge, Birmingham, secretary. [E. R. J., May 3, '13.]

Birmingham-Tuscaloosa Railroad & Utilities Corporation, Birmingham, Ala.—This company is making surveys for its 55-mile railway between Birmingham, Tuscaloosa and Bessemer. The line is being built by the Tidewater Construction Company, Birmingham. C. R. Carter, Birmingham, president, and G. Q. Brown, Birmingham, chief engineer. [E. R. J., March 29, '13.]

British Columbia Electric Railway, Vancouver, B. C.—This company has offered to construct a 4-mile line across West Vancouver municipality, this being an extension of the company's North Vancouver lines. This company has awarded a contract to Hoge & Peterson, New Westminster, to build an elevated trestle at Granville Street in Vancouver.

Northern Electric Railway, Chico, Cal.—This company has placed in operation its line into Colusa.

Fresno (Cal.) Traction Company.—Work will be begun at once by this company on a 9-mile extension from the Wishon Avenue line in Fresno to the San Joaquin River.

Pacific Electric Railway, Los Angeles, Cal.—A decision has been rendered granting the application of this company to construct its track at grade across ten public highways in Bay City, across certain streets in Los Angeles and across the tracks of the San Pedro, Los Angeles & Salt Lake Railroad on Pasadena Avenue, Los Angeles.

San Francisco, Cal.—The Board of Supervisors has authorized a bond issue of $3,500,000 to build the municipal electric railway lines on Van Ness Avenue, Stockton, Church and California Streets; also for the reconstruction of the Union Street lines in San Francisco.

Shore Line Electric Railway, Norwich, Conn.—Work will be begun at once by this company on a 1-mile extension from Ferry Road Crossing to the Connecticut River Bridge in Old Saybrook.

Covington & Orford Street Railway, Covington, Ga.—It is reported that this company plans to increase its capital stock from $10,000 to $50,000 and convert the line into an electric railway. It is also intended to extend the line 3 miles to Porterdale.

***Jackson, Ga.**—C. S. Maddox, Parham Smith and J. D. Jones are considering plans to build an electric railway in Jackson.

Fort Wayne & Northwestern Railroad, Fort Wayne, Ind.—This company, formerly the Toledo & Chicago Interurban Railway, plans to extend the line to Toledo, either by building its own track from Waterloo or through the extension of the Toledo & Indiana Traction Company from Bryan to Waterloo. The company will also build an extension to Goshen.

Eastern Railway, Cedar Rapids, Ia.—Preliminary surveys have been completed by this company for its electric railway to connect Iowa City, West Liberty and Muscatine. The company will furnish power for lighting purposes. Its power house and repair shops will be located at Cedar

Rapids. Officers: F. A. Groeltz, president; C. S. Woodward, secretary; Isaac B. Smith, treasurer; John A. Reed, and J. D. Wardle, chief engineer, all of Cedar Rapids.

*Atchison, Kan.—Plans are being considered by Atchison capitalists to build an electric railway to connect Atchison, Hiawatha, Effingham, Horton, Everest, Kennekuk, Willis and Banker. The names of those interested in the proposition have not yet been made public.

Union Traction Company, Independence, Kan.—The citizens of Coffeyville have voted bonds to the amount of $30,000 to assure the construction of the line between Coffeyville, Bartlesville and Nowata.

United Water, Light & Traction Company, Somerset, Ky.—It is reported that this company plans to build a 6-mile extension from Somerset to Burnside.

Cheboygan Electric Light & Power Company, Cheboygan, Mich.—This company states that the proposition to build the 38-mile line between Cheboygan and Petoskey is still in the preliminary stage and there are no definite plans as to when its construction will be begun. F. B. Spencer, general manager. [E. R. J., May 10, '13.]

Trans-St. Mary's Traction Company, Sault Ste. Marie, Mich.—During the next few weeks this company will build a 500-ft. extension of its line in Sault Ste. Marie.

Interstate Power & Light Company, Duluth, Minn.—Plans are being made by this company for improvements to its lines in Duluth.

Electric Short Line Railway, Minneapolis, Minn.—Plans are being considered by this company for an extension to Glenwood and Alexandria.

Kingston & Excelsior Springs Electric Railroad, Kingston, Mo.—Surveys are being made by this company for its 25-mile line from Kingston to Lawson and Excelsior Springs. The plans include two 30-ft. bridges, one over Log Creek near Kingston and the other over Crooked River near Elmira, besides four or five smaller bridges. John W. Johnson, secretary. [E. R. J., May 3, '13.]

International Railway, Buffalo, N. Y.—Work has been begun by this company on the surveys for double-tracking its 12.6-mile line between North Tonawanda and Lockport.

Hornell (N. Y.) Traction Company.—Plans are being made by this company to build a 1-mile extension from Seneca Street to the new site of the Hornell Country Club via North Hornell.

Buffalo, Lockport & Rochester Railway, Rochester, N. Y.—Plans are being considered by this company to double-track its line between Lockport and Middleport. The double track will also be extended westward from the Rochester terminal.

Geneva & Auburn Railway, Seneca Falls, N. Y.—This company expects to extend its line to Auburn, where it would connect with other electric lines going east and west.

Brazil, Devil's Lake & Minneapolis Electric Railway, Brazil, N. D.—This company has laid 5 miles of track from Devil's Lake to North Chautauqua and is now making preliminary surveys from North Chautauqua to Fort Totten, 9 miles. This railway will connect Brazil, Devil's Lake and Bismarck, N. D., and Minneapolis, Minn. A. B. Fox, Brazil, president. [E. R. J., Feb. 22, '13.]

Fostoria & Fremont Electric Railway, Fostoria, Ohio.—Preliminary surveys are being made by this company for an extension from Fremont to Port Clinton.

Middletown, Reading & Cincinnati Interurban Railway, Middletown, Ohio.—At a recent meeting of the directors of this company it was decided to build its line between West Chester and Dayton. Michael Klaiber, Jr., Reading, is interested. [E. R. J., March 22, '13.]

Berlin & Waterloo Street Railway, Berlin, Ont.—The citizens of Berlin have voted to raise $30,000 for a double track from Wellington Street to the Waterloo boundary line.

Dominion Power & Transmission Company, Ltd., Hamilton, Ont.—This company has received permission to build its line from Hamilton to Galt.

Kingston, Ont.—The Hydro-Electric Power Commission of Ontario has been asked by the Kingston (Ont.) civic utilities committee to furnish information regarding the cost of building an electric railway from Kingston to Cornwall.

Ottawa (Ont.) Electric Railway.—Work will be begun at once by this company double-tracking several of its lines in Ottawa.

Mount Hood Railroad, Portland, Ore.—This company is just completing a trestle 600 ft. long and 32 ft. high on the extension of its line into the Lost Lake country.

Oregon-Washington Railroad & Navigation Company, Portland, Ore.—Plans are being considered by this company to build an electric railway between Kennewick through Richland. J. P. O'Brien, vice-president.

Portland Railway, Light & Power Company, Portland, Ore.—This company has been asked to consider plans to build a line in Portland to be known as the East Side cross city line. The matter is now in the hands of the City Council. Work has been begun on the extension of the Hawthorne Avenue line. About 1 mile of track will be laid through the South Mount Tabor district.

Schuylkill County Railway, Harrisburg, Pa.—Surveys have been made by this company to connect Frackville with the company's line at Mahanoy Place. [E. R. J., April 5, '13.]

People's Street Railway, Nanticoke, Pa.—During the next few weeks this company plans to build 3700 ft. of track with 7-in. high T-rails. It has purchased the rails from the Pennsylvania Steel Company.

Philadelphia (Pa.) Rapid Transit Company.—This company is asked to consider plans to extend the Bridesburg, Front and Tioga Street branches of the Second and Third Street lines from Dock Street to South Street in Philadelphia.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—Work will be begun at once by this company on the line from Ellwood City to Beaver Falls. The company has received a ninety-nine-year franchise for this proposed extension.

*Punxsutawney, Pa.—Plans are being considered to build an electric railway to connect Punxsutawney, Rossiter, North Rossiter, Frances Mines and Cloe. No names are yet given of the people interested.

Titusville (Pa.) Electric Traction Company.—About 2 miles of track out from Titusville have been laid by this company on its line from Cambridge Springs to Meadville. It will take 19 more miles to make a connection with the Titusville end of the old line at a point near Tyronville. The track is standard-gage and 80-lb. rails are being used. Gasoline cars will be operated.

Wilkes-Barre & Wyoming Valley Traction Company, Wilkes-Barre, Pa.—Work has been begun by this company on the extension of its North Main Street line in Wilkes-Barre to Brockside, where it will connect with the present line.

Sioux Falls & Southern Minnesota Traction Company, Sioux Falls, S. D.—This company has secured nearly all the right-of-way for its 110-mile line between Sioux Falls, S. D., and Albert Lea, Minn. W. H. Knight is interested. [E. R. J., March 8, '13.]

Memphis & Rugby Railway, Memphis, Tenn.—Work has been begun by this company on its 4-mile electric railway to connect Memphis with Rugby. Officers: Luke Seawell, 1416 Tennessee Trust Building, Memphis, president and treasurer; W. J. Francis, vice-president, general manager and purchasing agent; Henry Wetter, secretary, and W. J. Ferree, 11 South Second Street, Memphis, chief engineer. [E. R. J., April 23, '11.]

Barre & Montpelier Traction & Power Company, Montpelier, Vt.—During the next few weeks this company plans to lay 100-lb. girder rails for 1722 ft. of paving on Main Street in Barre.

Virginia Railway & Power Company, Richmond, Va.—This company has awarded a contract to Louis Lawson for grading its line on Bute Street and York Street in Norfolk. It plans to begin construction at once on the extension of its Hull Street line in Richmond from the present terminal to Broad Rock Road via New Road.

Wheeling (W. Va.) Traction Company.—This company will spend a considerable sum in improvements to its properties in the Wheeling district. A mortgage to secure an issue of $10,000,000 of bonds was authorized recently to provide funds to retire outstanding bonds and for improvements. The improvements include extensions from Barton to St. Clairsville, from Bellaire to Neffs and from Wheeling to Weirton and Brilliant.

Beloit, Delavan & Clinton Railway, Beloit, Wis.—Preliminary arrangements are being made by this company to begin the construction of its 22½-mile line between Beloit, Clinton, Delavan and Darien in the fall. The company will furnish power for lighting purposes and will operate two cars. The power house and repair shops will be located at Beloit. W. Bradley Tyrel, Beloit, is interested. [E. R. J., May 24, '13.]

Chicago & Wisconsin Valley Railway, Madison, Wis.—Work will soon be begun by this company on the line between Portage and Prairie du Sac via Madison.

SHOPS AND BUILDINGS

British Columbia Electric Railway, Vancouver, B. C.—This company has asked Westinghouse Church & Kerr Company, New York, N. Y., to prepare plans and estimates for the construction of new repair shops in Burnaby.

Southern Pacific Company, San Francisco, Cal.—It is reported that this company has purchased property between Fourth, Fifth, Oak and Pine Streets in Portland on which it plans to build a new terminal building.

Central Illinois Public Service Company, Mattoon, Ill.—During the next few weeks this company will build a new carhouse at Taylorville. The structure will be 35 ft. by 100 ft.

Illinois Traction Company System, Peoria, Ill.—This company has awarded a contract to English Brothers, Champaign, to build its new three-story passenger station in Champaign. The structure will be 50 ft. x 125 ft. of Blackstone brick and terra-cotta construction. The cost is estimated to be about $60,000.

Duquesne & Dravosburg Street Railway, Duquesne, Pa.—During the next few weeks this company plans to build a new carhouse.

Southern Traction Company, Dallas, Tex.—Plans are being prepared by this company to build extensive machine shops to be located at some point in the vicinity of the southern limits of Dallas. The plant and its facilities will be ample to do all of the work required on the Dallas-Corsicana and Dallas-Waco interurban lines and part of that required by the Dallas-Denison line.

POWER HOUSES AND SUBSTATIONS

Birmingham-Tuscaloosa Railway & Utilities Company, Birmingham, Ala.—This company has recently purchased equipment for its power house and substation for electrifying the Tuscaloosa Belt Railway.

St. John's Electric Railway, St. Augustine, Fla.—This company has purchased superheaters for three boiler sets for its power house in St. Augustine.

Fort Wayne & Northwestern Railroad, Fort Wayne, Ind.—Plans are being made by this company to secure a location for a new substation in Auburn.

Iowa & Illinois Railway, Clinton, Ia.—Work has been begun by this company on its new substation at Bettendorf. Power will be obtained from the Moline plant of the People's Power Company.

Charlotte (N. C.) Electric Railway.—This company has placed a contract with the Allis-Chalmers Company for six 290-kw. 2300-volt generators direct-connected to six vertical hydraulic turbines, also for two hydraulic governors. This installation is to be made at the company's Yadkin River plant.

Columbus, Marion & Bucyrus Interurban Railway, Columbus, Ohio.—During the next few weeks this company plans to build a new power station with a capacity of 1000 kw.

Wheeling (W. Va.) Traction Company.—Plans are being made by this company to build a new power house on the site of the present building at McMechen, and substations will be maintained at this point and at Warwood. New equipment will be purchased.

Manufactures and Supplies

ROLLING STOCK

Duquesne & Dravosburg Street Railway, Duquesne, Pa., is in the market for two cars.

Ogden (Utah) Rapid Transit Company is reported as expecting to purchase two cars.

Trans-St. Mary's Traction Company, Sault Ste. Marie, Mich., expects to purchase two new cars.

Birmingham Railway, Light & Power Company, Birmingham, Ala., is in the market for twenty cars.

Charlotte (N. C.) Electric Railway has placed an order with the Southern Car Company for four city cars.

Cape Breton Electric Company, Sydney, N. S., is reported as expecting to purchase new cars for its different lines.

Athens Railway & Electric Company, Athens, Ga., has ordered two closed city cars from the Southern Car Company.

Dallas (Tex.) Electric Corporation has ordered fourteen city cars, through the Wendell & MacDuffie Company, from the St. Louis Car Company.

Port Arthur & Fort William Electric Railway, Port Arthur, Ont., has placed an order with the Ottawa Car Company for twelve cars. It is reported that the company will order additional cars in the near future.

Pittsburgh (Pa.) Railways, noted in the ELECTRIC RAILWAY JOURNAL of April 19, 1913, as having ordered fifty all-steel side-entrance semi-convertible prepayment cars from the St. Louis Car Company, has specified the following details for this equipment:

Seating capacity.....56	Car trimmings.....St. L.
Bolster centers, length, 21 ft. 8 in.	Conduits and junction boxes, St. L.
Length of body....30 ft. 8 in.	Couplers.....Van Dorn
Length over vestibule, 45 ft. 0 in.	Curtain fixtures...Cur. S. Co.
Width over sills...7 ft. 11 in.	Destination signs.....St. L.
Width over all.....8 ft. 2 in.	Gongs.....12 in. St. L.
Height, rail to sills.....22 in.	Hand brakes.....St. L.
Sill to trolley base, 8 ft. 9¼ in.	Headlights .....Union
Body .....semi-steel	Paint.....Flood & Conklin
Interior trim.....bronze	Sanders .....St. L.
Headlining..bird's-eye maple	Sash fixtures.....Edwards
Roof .....monitor	Seats.....St. L.
Underframe .....semi-steel	Seating material, canvas-lined rattan
Bumpers.....5-in. channels	Step treads....Carborundum
	Trucks.....St. L.

TRADE NOTES

Peter Smith Heater Company, Detroit, Mich., has received an order from the Beaver Valley Traction Company, New Brighton, Pa., for twelve heaters.

Ackley Brake & Supply Company, New York, N. Y., has received an order from the Danville (Ill.) Street Railway & Light Company for 279 ft. of automatic trolley guard.

Baldwin Locomotive Works, Philadelphia, Pa., have begun construction on their new plant at Calumet, East Chicago, Ind. The main building will be 1150 ft. long and 600 ft. wide.

C. W. Hunt Company, Inc., New York, N. Y., has been chartered in Albany, N. Y., with a capital of $500,000 to deal in hoisting machinery and appliances for handling coal and broken stone.

Engineering Construction Company, Chicago, Ill., has been organized to do a general engineering and contracting business. The officers of the company are: I. J. Crowley, general manager; E. A. Clark, chief engineer, and James X. Gunning, secretary and treasurer.

The J. G. Brill Company, Philadelphia, Pa., has recently received orders for 21-E trucks from the Tidewater Power Company, Wilmington, N. C.; Lewiston, Milton & Watsontown Passenger Railway, Milton, Pa., and the New Orleans Railway & Light Company, New Orleans, La.

Drake Railway Automotrice Company, Chicago, Ill., announces that the "Dracar" has been selected by the French government as the most advantageous self-propelled unit

service in connection with the government arsenals and the port of Brest. The Paris office of the company will supply five cars.

F. A. Thayer & Company, New York, N. Y., have been appointed exclusive American selling agents for the Chillingworth Works, Nurnberg, Germany, manufacturers of sheet-steel gear cases. Each half of this seamless gear case, which is made by a patented process of construction, is drawn from one piece of sheet steel. The case is now in use by over 200 European tramways.

Pyrene Manufacturing Company, New York, N. Y., has received orders for fire extinguishers from the Berkshire Street Railway, Pittsfield, Mass.; Fort Dodge, Des Moines & Southern Railway, Boone, Ia.; Interborough Rapid Transit Company, New York, N. Y.; Michigan United Traction Company, Jackson, Mich.; Pennsylvania Railroad, Philadelphia, Pa., and West Penn Railway, Pittsburgh, Pa.

Westinghouse, Church, Kerr & Company, New York, N. Y., have been engaged as consulting engineers by the British Columbia Electric Railway, Vancouver, B. C., in connection with the building of its repair shop, just outside the city of Vancouver. The company is now engaged in preparing plans, with the idea that this plant shall do all the heavier repair work for all the lines operating on the southern mainland of British Columbia.

Ohio Brass Company, Mansfield, Ohio, has received orders from the following railways for couplers complete with spring carriers and anchorages: New York State Railways, Rochester, N. Y., 55; Detroit (Mich.) United Railways, 100; Cleveland (Ohio) Railways, 60; United Railways of St. Louis, St. Louis, Mo., 210. An order has also been received from Cataluña, Spain, for fifty-two automatic air connecting couplers and draft-gear equipments.

Wendell & MacDuffie Company, New York, N. Y., has been appointed exclusive sales agent for the Waugh Draft Gear Company, which has purchased from Forsyth Bros. the following railway specialties: buffing device, draft gear, radial device, yoke device, centering device and the truck actuating device. The company has received an order for 604 Waugh draft gear equipments, to be used on all subway and elevated cars of the Boston (Mass.) Elevated Railway.

Edison Storage Battery Company, Orange, N. J., has appointed W. C. Andrews and W. W. Coleman its sales engineers. Mr. Andrews was formerly associate editor of the Electric Railway Journal, and later accepted a position with the engineering and sales department of the General Electric Company. Mr. Coleman has been connected with the designing, engineering and construction department of the Union Switch & Signal Company for the past twelve years.

Curtain Supply Company, Chicago, Ill., has received an order to equip the thirty-six center-entrance stepless cars now being built by The J. G. Brill Company for the Pacific Electric Railway, Los Angeles, Cal., with curtains, using ring No. 88 fixtures and Rex all-metal rollers. Another order has also been received to equip the twenty cars of the Toronto (Ont.) Civic Line now being built by the Niles Car & Manufacturing Company with the same type of curtain. The Atlantic City & Shore Railway, Atlantic City, N. J., has also specified this type of curtain for its six new cars, now being built by the Southern Car Company.

Western Electric Company, New York, N. Y., has received an order from the Iowa Railway & Light Company, Cedar Rapids, Ia., for telephone train-dispatching apparatus for equipping its entire line, which runs from Cedar Rapids to Iowa City, Ia., a distance of approximately 30 miles. Ten way stations will be equipped with telephones and selective signaling apparatus. The No. 102 selector sets containing the Western Electric No. 50 type selector will be used for signaling way-station operators. The company also states that at the beginning of 1913 there were over 70,000 miles of road in the United States and Canada using this method of controlling the movements of trains.

Eureka Company, North East, Pa., has recently established an Eastern branch office at 253 Broadway, New York, in charge of George E. Austin, president of the American General Engineering Company, for the purpose of taking care of its increased business in the various electric traction materials manufactured by it for the Eastern States. The company will carry a complete stock of standard railway materials in New York in order to give prompt and efficient service. The Eureka Company has recently enlarged its manufacturing facilities and has added three new buildings to its present plant. The establishment of this branch should assure the Eastern customers of the Eureka Company of prompt shipments and careful attention. As the American General Engineering Company has for the past twelve years manufactured special repair shop appliances for electric railways, it has a large clientage in the Eastern States, and it is believed that the mutual co-operation between the two companies under the management of George E. Austin will serve the best interest of both.

ADVERTISING LITERATURE

Beaudry & Company, Inc., Boston, Mass., have issued a booklet illustrating and describing the different types of Beaudry power hammers.

H. M. Byllesby & Company, Chicago, Ill., have recently issued Department Bulletin No. 4, on "Expert Assistance in Cases Before Commissions."

Tate, Jones & Company, Inc., Pittsburgh, Pa., have issued their second bulletin on blacksmithing and drop forging, which takes up particularly the subject of heavy forgings.

Westinghouse, Church, Kerr & Company, New York, N. Y., have issued "Work Done" No. 5, which describes and illustrates the railway shops recently constructed by them.

Pyrene Manufacturing Company, New York, N. Y., has published the *Pyrene Bulletin* for May, 1913. It contains several interesting articles and illustrations of fires put out with its extinguisher.

The R. Haas Electric & Manufacturing Company, Springfield, Ill., has issued Bulletin No. 1101, illustrating and describing the Ideal alternating-current gong. The gong is made in both 8-in. and 10-in. sizes.

Union Switch & Signal Company, Swissvale, Pa., has issued Bulletin No. 66, describing in detail its apprenticeship course. The bulletin also contains a large number of views of the various departments at the works.

Edward B. Smith & Company, Philadelphia, Pa., has printed an interesting booklet describing over fifty short term bond and note issues maturing from 1913 to 1917 and arranged according to the date of maturity.

N. W. Halsey & Company, New York, N. Y., have prepared and are offering for distribution a pamphlet dealing with the laws of the State of New York governing savings bank investments. The pamphlet contains a list of municipal and railroad bonds in which savings banks may legally invest their funds.

The J. G. Brill Company, Philadelphia, Pa., prints in its May, 1913, issue of the *Brill Magazine* an illustrated biography of W. R. Alberger, vice-president and general manager of the San Francisco, Oakland Terminal Railways, Oakland, Cal. Among the feature articles are the following: "Conditions Which Govern the Type of Car for City Service, Oakland, Cal.," "Interesting Rolling Stock for New Peruvian Electric Road," "Interesting Cars for Syracuse & Suburban Railroad," "Prepayment Cars for St. Thomas, Ontario," "The New Pittsburgh Autobus Line" and "Unusual Air-Controlled Sand Cars for Philadelphia."

General Electric Company, Schenectady, N. Y., has issued Bulletin No. A-4116, describing isolated and small-plant alternating-current switchboard panels, both generator and feeder, for three-phase, 25-cycle to 60-cycle circuit. The bulletin is made up principally of dimension and connection diagrams and miscellaneous data referring to the various panels and equipments. The company has also issued Bulletins Nos. A-4035, A-4109, A-4114 and A-4122, illustrating and describing "Series Luminous Arc Lamps," "Belt-Driven Revolving Armature Alternators," "Central-Station Oil Switches" and "Carrier Bus Arc Panels for Brush Arc Generators," respectively.