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EDITORIAL NOTICE

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Contents of this Issue

The New President

President Roosevelt will enter office with the sympathy and best wishes of a united nation. The tragic occurrence which has led to his accession to office is in the minds of all no less than his own, as he assumes the reins of power which fell last week from the hands of his predecessor in Buffalo. Unwilling as he was a year ago to accept the nomination to the vice-presidency, and yielding only because it was the evident wish of the nation that he should accept the nomination, he now enters the presidency with no ante-election promises to be fulfilled and free to carry out the policy which he believes best for the nation. He has already announced that this, in his best judgment, is that pursued by his immediate predecessor, and the one under which unexampled prosperity has been brought to this country. Those who are acquainted with President Roosevelt know the high principles which direct his actions, his devotion to what he believes to be his duty, and his ability to command the support and respect of his immediate associates and the people at large. Impressed as he will be by the responsibility connected with the office of President, entering as he is upon his term under the sad circumstances which have produced it, and commencing his administration after that of President McKinley, whose policies have won the approval of this country, we look forward to the administration of the new President with the confident belief that the tide of prosperity will not set back and to the same safe and conservative management of affairs which characterized that of President McKinley.

Student Supernumeraries

One of our American college professors has lately written some very interesting and instructive articles describing how he indulged his taste for nomadic life by becoming a tramp. It would not appear that he made much money in those "wander years," but he gained a heap of experience as to what goes on in the social depths, and as to why those unhappy depths exist. This year a good many college students have taken a similar plunge into the actualities of life, but in cleaner waters. As we noted early in the summer, the Brooklyn Rapid Transit Company engaged a number of students as extras to help it meet the summer rush to the bays and the beaches. They are now going back to college, and it is said that some of them have laid by enough to take them through the college year with a margin for incidentals after board, books and tuition expenses have been met. The Brooklyn *Eagle* says:

"The officials of the railroad company who employed the small host of college men this season, more or less as an experiment, express themselves as being thoroughly satisfied with the work which they have done. All of the men have been found to be honest and trustworthy in every respect, and, besides, are said to have given much cause for satisfaction among passengers on the cars of which they were in charge, because of their good breeding and politeness. The wish was expressed to-day by General Superintendent W. W. Wheatley, who is in charge of all the surface roads of the Brooklyn Rapid Transit Company, that he might keep all of the college bred men now in the road's employ permanently, and thus better the service appreciably."

Surely these young men will have benefited by the experience in many ways. Some of them some day will be managers and presidents of trolley roads, and will get large dividends on this summer's work. In fact, we don't know why it would not be a good thing for all who fill such positions to serve first as conductor and motorman. Many now at the top have had that experience in the past, and their successors would be all the better for it.

The City Transportation Problem

George Westinghouse, while in England recently, addressed a most interesting and suggestive letter to the London *Times* on the text furnished by Arthur Balfour in his comments on the relief afforded by the West London trolleys. We commented ourselves not long ago on Mr. Balfour's remarks, which derived significance not only from the fact that they came from the Conservative leader in the British House of Commons, but be-

cause they were the shrewd observations of a man of deep intuition. Mr. Westinghouse, in his own comment, again emphasized the value of electric traction, and he pointed out that the solution of the London problem carried with it that for many other congested cities. One utterance of his is remarkably pregnant with meaning:

The electric propulsion of vehicles, already well extended, admits, however, of such radical departure from the old way as to suggest that we may, by discarding many of our old ideas and methods, have a veritable revolution in the prevailing practice. This point is illustrated by the fact that an electric railway, upon which single cars are run at frequent intervals for a distance of about 45 miles, parallel to one of the standard railways in the United States, is, after being two years in operation, carrying twenty times as many passengers as were formerly carried by the steam railway between the same points.

Mr. Westinghouse also suggests that in the not distant future there will be central supply stations grinding out current for every variety of service, including the trolleys; and in this country a long step has already been made in that direction. He goes further, however, and outlines a plan of hiring car equipment, not unfamiliar here in America, which would certainly do much to induce old steam roads to make sooner the inevitable change to electricity.

As to power plants for such wholesale generation of current, Mr. Westinghouse returned to the idea at which he has been hammering for years, namely, the use of gas engines, as prime movers. To quote his own language:

Roughly stated, the expense for fuel and labor for the production of electricity by a gas-engine equipment will not be greatly above one-third of that of the highest type of steam plant, while, in comparison with the average steam plant, the fuel consumption and cost will not exceed one-quarter. The decreased cost of production of electricity by means of gas engines, as compared with the present steam-engine plants, would enable a Board of Trade unit to be sold at so low a figure as to justify a wide use of the electric current for cooking and heating purposes. In discussing the importance of the cheaper generation of electricity by means of gas engines and producer gas, one is met by much scepticism and frequently by the arguments of people having contrary interests. A sufficient answer to the sceptic and the interested party is the fact that apparatus will be supplied and results guaranteed. Representatives of large interests, ignoring what has heretofore taken place, have observed that to put in a large gas-engine plant would be a great experiment; but on this point one may reply that it would be a much greater experiment to now establish a modern steam-engine alternating generating plant, and, in view of what can be accomplished with such economies with the gas engine, a far greater risk.

Here is certainly food for thought, and it is never to be forgotten that Mr. Westinghouse, besides being a profound thinker, is ever a leader and a man of action.

The New York Railroad Club

Among the pleasantest features of the coming season will be the monthly meetings of the New York Railroad Club. Of the club's membership quite a large portion is drawn from the street railway companies of the Metropolitan district, and the interests of this faction will be looked after to a much greater extent this year than ever before. The first meeting had been scheduled for Thursday, Sept. 19, but out of respect for the memory of our late President it has been postponed a week and will be held on Sept. 26. Although primarily a steam railroad man's club, the similarity of the problems encountered in steam and electric railroading has attracted many street railway men to the meetings, while quite a number of the members have transferred their attentions from the operation of the older type of railroading to the more modern, and are now solely identified with electric railway management. It is, therefore, a great pleasure to learn that at the opening meeting, the paper to be read and discussed is on a subject which appeals alike to all classes of railroad engineers, viz., brakes. The paper will be presented by F. M. Nellis, inspector and instructor of the Westinghouse Air Brake Company and secretary of the Air Brake Association, and will deal with brakes in both railroad and street car work. The well-known familiarity of the author with his subject, as well as the assurances already received from many eminent engineers and specialists of their intention to take part in the discussion, promises a most interesting and instructive evening. General Manager Thomas, of the Nashville, Chattanooga & St. Louis Railroad, has promised to open the discussion. On electric railways, with their constantly increasing acceleration, the question of "deceleration" is of ever-growing importance. As Mr. Vreeland, the club's president, has wittily remarked, " it is easy enough to stop the car, but how are you going to stop the passenger?" As the satisfactory operation of a high-speed schedule depends almost entirely upon the ability of the motorman to start or stop his car or train in the smallest possible interval of time, it is most important to have at the braking end some negative counterpart of the uniformly accelerated velocities obtained by the use of automatically regulated controllers, as found in the types of multiple-unit control systems now perfected. W. B. Yereance, assistant to the general superintendent of the Brooklyn Rapid Transit Company, the energetic secretary of the club, desires greatly that the opening meeting be attended by a large contingent of street railway men, and the programme which he has prepared surely leaves them little excuse for being absent on Sept. 26.

The Rochester Convention

The detailed account of the business sessions of the nineteenth annual convention of the New York Street Railway Association, which was held in Rochester last week, is published elsewhere in these columns. The report of the discussions, though necessarily greatly abridged for these columns, nevertheless occupies nearly nine pages in this issue, excluding entirely the papers themselves, which were presented at the convention. This statement alone gives the reader a good idea of the extent of the work accomplished at Rochester, and a perusal of the proceedings there show results and conclusions of the highest every-day practical value to street railway operators all over the country. The topics discussed were those which every manager of a street railway company has to consider, perhaps, a dozen times in the twenty-four hours, and on them he has the opinions of men who are operating some of the most successful roads in the country. These opinions, through the generous policy pursued by the association, are freely given to the press, and no restriction is placed either on their publication or on attendance at any of the annual meetings of the association by anyone who possesses any interest in street railroading.

* * *

The broad policy pursued by the association in this way (and by the American Association as well) is so old that its significance is perhaps sometimes forgotten. The somewhat popular idea of a street railway convention is that of an aggregation of multi-millionaires, who gather in a hotel parlor behind closed doors and discuss plans by which the public suffers. Instead of this prevalent conception, we find a group of busy men who have temporarily left their work to consult together how they can best improve their service by making it safer and more desirable. And in this connection we wish to say that we believe that those who take an active part in discussions of this kind, where the proceedings are made public, deserve the thanks of all others in a similar line of business, for the light which they throw on disputed questions of policy, as it must necessarily be done at a considerable sacrifice of their time.

* * *

Undoubtedly the two most important questions discussed at the Rochester convention were on "How to Increase the Efficiency of Employees" and on the proposed rules for motormen and conductors. The first is, of course, not a subject which can be disposed of at a single meeting. As one speaker said, it has afforded discussion for the steam railroad operators for the last fifty years and they are not through with it yet. The conditions in street railway service, owing to the greater size of the force employed and the larger number of new men engaged annually, make the

subject a much more complicated one than in steam railroad service. The only result, therefore, which can be expected from any one meeting is the interchange of experience and explanations of the conditions under which each road operates. These, it was found, were exceedingly varied, one road regularly engaging and breaking in some 1200 new men every year, while on other roads the force remains practically unchanged from one year to another. The methods of discipline were equally varied, as some believed in suspensions while on other roads ratings on the civil service methods were employed. It was not the object of the association at Rochester, still less is it the purpose in this column, at this time, to pass upon the relative advantages of the different methods of control. It should be said, however, that the trend of practice is certainly in the direction of giving emoluments in one form or another for good records, and of improving the efficiency of the service, both by being more strict in regard to the qualifications of applicants for work and of gradually getting rid of those who have proved themselves inefficient. Greater unanimity of opinion was expressed on the desirability of mutual benefit associations among the employees. These are of comparatively recent origin on many roads, but the representatives of those companies present at Rochester, upon whose lines associations of this kind exist, were a unit in regarding them with favor, both as a means of instilling an *esprit de corps* among the men, and of bringing them into closer relations with the officials of the company.

* * *

The report on the standard set of rules and regulations for motormen and conductors was another action of importance taken at Rochester. There are arguments, of course, both in favor and against a standard set of rules. The principal reason against them, besides the fact that local conditions have a most important bearing on the rules, is that individual managers, like individuals in every other line of business, have their own methods of achieving certain results, and these methods being natural to them, are usually more successful than if all tried to follow one general plan. On the other hand, the arguments in favor of a standard set of rules are equally, if not more, weighty. The question of local conditions can be satisfactorily arranged by giving a certain latitude to such rules as would be affected by these conditions, and the general principles of railroading are sufficiently uniform so that they can, in a broad sense, be followed on practically all roads. On the other hand, there are two special reasons in favor of uniformity in this direction. Each company gets the best of the experience of others, and in cases of accident the rules under which the motormen work would undoubtedly have a better standing if they had the indorsement of all the companies of a State rather than if they represented the idea of an individual manager. An added value would be given to the rules in this case if they should also be indorsed by the Railroad Commissioners. Such an indorsement would undoubtedly be given them by the latter body if the commissioners were convinced that the rules were the best which could be devised.

* * *

Owing to lack of space in this issue the rules themselves, which, it must be understood, were simply tentative and offered as a recommendation only, will be published next week. The discussion, however, is given in this number. The greater part of the discussion was over the feasibility of the rule forbidding passengers to ride on steps. The rule, like many others on the list, was formulated by the committee, not because it was thought to be unquestionably the proper thing, but to test the sentiment of the delegates. When the discussion of the rules began objection was made to this rule by a member, who stated that it would be utterly impossible to enforce it on some roads at all times; that the people would ride on the steps when there was an unusual crowd. He was soon followed by members who told of the perfect enforcement of this rule on their respective roads. Those who maintained the impossibility of enforcing the rule then limited their claims as to cases of small roads only, where equipment to move large and unusual crowds was limited, and policemen were few and far between. This theory was unchallenged for several minutes, until a former member volunteered the information that it was entirely possible to enforce the rule on small roads at all times and places, as he had done it. It did, however, appear later in the discussion that considerable difficulty is sometimes experienced in clearing the steps on a small road where a drunk and disorderly picnic crowd has to be handled. The testimony of managers of both large and small properties conclusively showed, however, that it is entirely possible to enforce the rule if a determined effort is made, and that it is being done under all kinds of conditions. This settled the question of possibility, and left the point at issue whether it was really desirable to have such a rule or not. With conditions as in New York City, where the congestion of traffic in narrow streets makes it dangerous to stand on the runningboard, the necessity of the rule is unquestioned. In smaller cities, particularly in the West, where there is more room in the streets and the motormen in passing teams can always easily make allowance for the large runningboard load which is ever present on rush trips, we believe that such a rule would not receive favor from either the public or the management. The necessity for such a regulation should be judged very largely by the relative per cent of accidents due to passengers riding on the steps. The committee on accidents appointed at that same session of the convention should be able to throw some light on that at next meeting. The rule, however, has its legal aspect, which is more important than its practical results on the great majority of roads. It seems somewhat likely that the presence of such a rule on the company's books and a notification to passengers of its existence and that they ride on the step at their own risk would, like the similar rule on the steam roads, release the company from liability in case of accident to a passenger riding on the step, even though forcible means were not taken to enforce the rule. How far the courts would hold to this position is a question, but in view of the possible legal release involved it might be a good rule to allow passengers to ride on steps at their own risk only, even if an enforced prohibition of step riding was not made.

* * *

One of the first things to attract the attention of street railway visitors at Rochester last week was the track construction going on there in the streets and employing for this pieces of old girder rail. After seeing this construction it was with special interest that the convention listened to the short paper by Le Grand Brown, chief engineer of the Rochester Railway Company, on this steel-tie construction. The principal point brought out by the paper and the discussion which followed was that the use of a girder form of tie, such as afforded by the old rail, held the track down and kept it from heaving when the ties were surrounded with concrete, whereas steel ties of angle-bar form are not so perfectly held by the surrounding concrete, and the track can work up and down or sideways. Counting the old rail at its market price, the expense of track laid with these ties is no more than with wood ties, as the steel ties do not need to be laid at such frequent intervals as the wood. The electric joint welding which is going on at Rochester also was a source of much interest to track engineers. Those who have visited Buffalo this season have had opportunity to see, by riding for miles on the Buffalo railway lines, the practically perfect results that are now possible with electric track welding after the many years of unsuccessful experiment in that direction.

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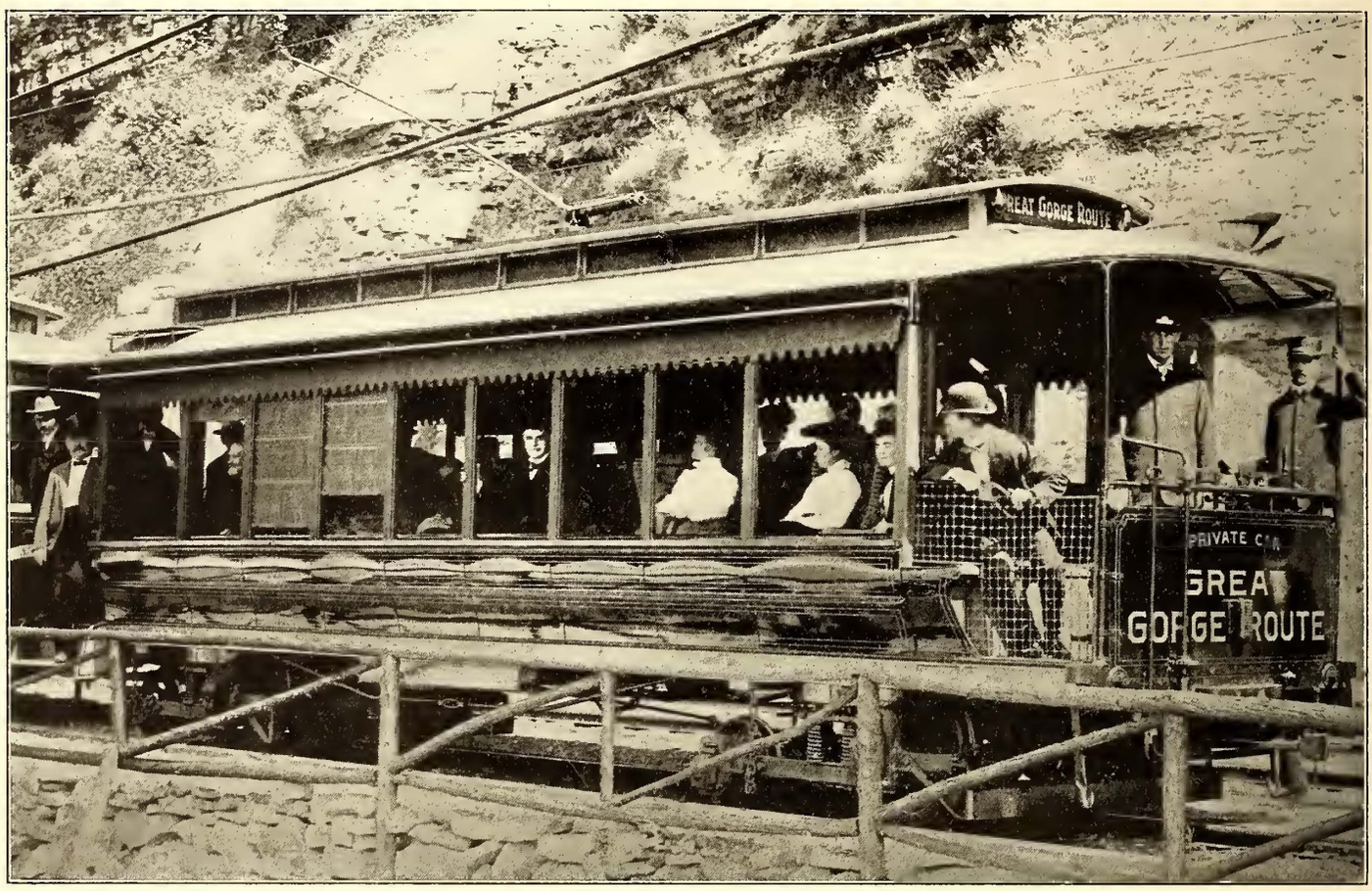
It is impossible in this issue fully to review all of the papers presented at Rochester. Some of them were printed and commented upon last week, and most of the remaining papers will be found in this issue. They speak for themselves and represent careful investigation on the part of the writers of the topics treated. As most of them were also discussed at length by the association, a full opportunity was afforded at the meeting to bring out the salient features of each, and readers are referred for such analysis to the discussion and the papers themselves.

The President at Niagara

On Sept. 6, the day on which he was struck down by the villainous assassin, President McKinley, his wife, a number of friends and relatives and diplomats, in all a party of about 107, made a trip to Niagara Falls, visiting the power house of the Niagara Falls Power Company, and enjoying a ride over the picturesque



[*Photo. Copyright, 1901, by C. D. Brinckerhoff* PRESIDENT MC KINLEY AND PARTY AT NIAGARA

Gorge Railroad. President McKinley and the party left Buffalo by special train over the New York Central Railroad at 9:50 o'clock and traveled direct to Lewiston, arriving there at 10:07. Four special cars had been provided by the Niagara Gorge Railroad, and the President occupied the first of these cars. Little time was lost in boarding the cars, but the route was traveled slowly, thus giving the party a chance to realize all there is in this beautiful ride. It was during this trip and only about four hours before he was shot that the photograph presented herewith was taken.

Niagara Falls was reached at 11:15 o'clock, and the party then viewed the falls, President and Mrs. McKinley being driven as far as the center of the Suspension Bridge. After the party had partaken of lunch the power plant was visited. The President inspected every part of the great plant, even descending by the elevator to the bottom of the pit. Over half an hour was spent at the power house, and at 2:50 the return trip to Buffalo was begun in order that the President might attend the afternoon ceremonies at the Exposition.

The Pittsburg Consolidation

The negotiations for the transfer of the control of the Consolidated Traction Company and the Southern Traction Company to the Philadelphia Company were practically completed last week, and formal transfer will probably be completed within forty-five days. The transaction involves over $30,000,000, and, when consummated, the Philadelphia Company will become the parent company, and have complete control of practically all the traction interests of Pittsburgh and Allegheny, as well as most of the Allegheny County. The total issue of stock of the companies involved is as follows: Philadelphia Company, $19,000,000; Consolidated Traction Company, $27,000,000; Southern Traction Company, $5,000,000; total, $51,000,000. According to the terms of the merger, the Philadelphia Company acquires the preferred and common stocks of the Consolidated Traction Company. To make this purchase the company will increase outstanding securities and create a new collateral bond issue. New 5 per cent bonds to the extent of $12,000,000 will be issued, the preferred 5 per cent stock will be increased by $1,800,000 and the common stock will be increased by $8,100,000.

Parlor and Sleeping Car Service Between Cincinnati and Columbus

The Pomeroy-Mandelbaum syndicate has practically completed traffic arrangements with the Appleyard syndicate, of Columbus, whereby through parlor and sleeping cars will be operated from Cincinnati to Columbus. The roads utilized will be the Southern Ohio Traction Company to Dayton; the Dayton, Springfield & Urbana Railway to Springfield, and the Columbus, London & Springfield Railway to Columbus. The first two mentioned are in operation, and the last will be completed in the near future. This arrangement indicates that the next move will be to operate through cars from Cleveland to Cincinnati, the route from Cleveland being over the Cleveland, Elyria & Western Railway, the Cleveland, Ashland & Mansfield Railway, the Mansfield, Galion & Crestline Railway, and the Columbus, Delaware & Marion Railway, all of which are either in operation or under construction. The scheme of running sleeping cars is by no means visionary, but will be an actual fact as soon as the Columbus, London & Springfield Railway is completed, contracts having been placed with the Barney & Smith Manufacturing Company, of Dayton, for both sleeping and parlor cars. These cars will be the first of their kind ever built for interurban roads. They will be considerably larger than the present interurban cars, and will be equipped with every possible convenience. It is stated that the schedule between Columbus and Cincinnati will be about six hours.

The Proceedings of the Rochester Convention

A brief report of the Rochester meeting of the New York State Street Railway Association was published in the last issue of this paper, together with the president's address and three of the papers. The complete report of the discussion is now available, and an abstract is given herewith.

Immediately after the presentation of the president's address Professor Carpenter, of Itacha, rose and said:

MR. CARPENTER.—In view of the sentiments which have been expressed in the annual address of our president, I desire to offer a resolution. This resolution has been carefully considered by the officers of this association, and it expresses their sentiments as well as my own, and I hope it may express the sentiments of all of us unanimously:

Whereas, The people of the United States have recently, and for the third time within the nation's history, been subjected to anguish and humiliation by the hand of the assassin, directed against the person and life of their chief magistrate, the President; and

Whereas, Such infamous crimes have been fostered and stimulated by the false teaching and malignant purposes of reckless and partisan free speakers and of a perverted free press; therefore

Resolved, That we, the representatives of the Street Railway Association of the State of New York, take this opportunity to express our sense of detestation for the crime and for all those who openly or covertly aid and abet it; and further, we urge and recommend the early passage of such legislation by the federal government, and by the several States, as will tend to repress anarchy, or the expression of anarchial sentiments and theories, and inflict swift and extreme punishment upon all who engage in such treasonable and seditious undertakings, and

Resolved, That we tender to President McKinley the expression of our highest confidence in the rectitude of his public acts; our sincere sympathy and affection for him in his present peril and suffering from the assassin's blow, and our deep detestation of the crime and the criminal, and

Resolved, That our hearts are made glad by the daily tidings indicating the President's sure and early recovery from his grievous wounds, and that we hereby supplicate the merciful hand of Divine Providence for the safeguarding of our stricken and beloved chief magistrate.

The resolutions were heartily and unanimously adopted.

The association then received and adopted the report of the executive committee, after which Mr. Green, master mechanic of the Rochester Railway Company, read a paper on track bonding. This was published last week.

MR. NICHOLL.—I would like to ask the members of the convention what their experience has been in taking up old bonds that have been in the street for from four to six years, particularly whether they have been found to be oxidized. We took out 2 miles or so of track a short time ago and did not find a single copper bond which was not oxidized at the connecting point. The bonds were of our own make, and the terminals were attached to the rails by means of a nut and bolt, but we found that the whole bond, not only the terminal, but all the way around, was oxidized. I do not think we found a single bond that came out as it was put in.

MR. COLE stated that in Cambridge the bonding had suffered greatly from electrolytic action, especially in gravel soil, where there were deposits of quicksand.

MR. SHIPLIN stated that his company had suffered severely from copper thieves, who would break off exposed bonds. He had then tried bonding under the fish-plate. This was more satisfactory, but the bonds had to be examined every spring, and some would be found broken. He believed the best bond to be a short bond close to the end of the rail or a plastic bond.

The paper on "Accidents," by Daniel W. Patterson, of the Metropolitan Strect Railway Company, was then read. This will be published next week.

THE PRESIDENT.—The next paper is that by Maurice Hoopes, on "Third-Rail Interurban Railways." Mr. Hoopes is an electrical engineer for J. G. White & Company, of New York. (Mr. Hoopes' paper was published last week.)

A MEMBER.—Can you successfully operate the third rail in an open country covered with snow in the winter?

MR. HOOPES.—There is no difficulty with the snow. It can be cleaned from the rail very nicely, and there is no difficulty about getting contact, but sleet is very difficult to handle. Our experience has shown that we need a better sleet scraper, but no scraper will as yet open the road. In fact, every road is subject to some sort of interruption during heavy storms. Elevated railroads, with a frequent headway, do not have much trouble, but roads not having frequent headway do.

MR. ELY.—I was told by a motorman of the New York, New Haven & Hartford Railroad Company the other day concerning the Cohassett line, that they were only bothered twice last winter by snow or sleet, and that the improved form of scraper which they have brought into use was very efficacious in removing the sleet.

COL. ASHLEY W. COLE.—Some two years ago Colonel Heft told me that he thought a plan would be developed by which the shoe could be carried along on the underside or alongside the third rail. He thought this arrangement would offer greater protection against accidental contact with the rail, and that it would also protect the rail from the sleet and ice trouble. I would like to ask Mr. Hoopes if he knows whether anything has been done in that connection, and, if not, whether it has been found impracticable?

MR. HOOPES.—There has been no such construction undertaken except experimentally, and no sufficient experimenting has been done to satisfy anyone as to the results possible. The matter is in the hands of the engineers interested in the subject, and I think that such a method of operation is quite possible. It would be very expensive for any road to undertake to install such an equipment throughout its line, because if not successful it would have to be changed over to the standard construction; besides, it is rather difficult to try that sort of experiment, because a road has to wait so long for the critical weather conditions. Nevertheless, the arrangement of the shoe resting upon the head of a rail, and held there by gravity, is very much easier to employ than any system that substitutes springs for gravity. For that reason the system that Colonel Heft proposes is objectionable, but it is not insurmountably so. I think it is worthy of a trial, and I am rather surprised that the colonel has not tried it before this time, but I am sure he has not.

THE PRESIDENT.—If there is no further discussion on this subject we will listen to the paper on "Storage Batteries," prepared by C. E. Roehl, of the Brooklyn Rapid Transit. The paper will be read by Mr. Morse. (This paper is published elsewhere in this issue.)

MR. MORSE.—I would like to add that our batteries have been in use for about a year and a half, and we have not had to make any repairs. We have not been obliged to remove any plates, and have no leaky cells, so that our expense in that respect has been very small; there has been no buckling of the plates. Of course, acid has to be added from time to time. I think, since the installation of the batteries we have used altogether about $200 worth of acid.

MR. ELY.—How about the deterioration in plates?

MR. MORSE.—It has not been noticable so far.

MR. ELY.—Can you give any idea of the amount of material deposited?

MR. MORSE.—There is a deposit in the bottom of all the cells, but we have not measured it. In fact, it is very hard to take measurements, because as the deposit goes to the bottom of our cells it forms a very hard cake, and if a person tried to dig through it, and he was not careful, he would go through the lead underneath it. I do not suppose the deposit amounts to more than a quarter of an inch.

MR. ELY.—Has it ever been removed?

MR. MORSE.—Not thus far. In time, I suppose, it will fill up so as to come very near the bottom of the plates, and then it will have to be removed.

MR. VREELAND.—Some two years ago, while we were erecting our large power station, we found that it would be impossible to get power from it in anywhere near the time required, so there was danger that we would have to commence the winter short at least a third of the amount of current we required to move our cars. It would have been impossible, of course, to have constructed an additional station and erect smaller generators in time. To meet the emergency we made a contract for two storage battery equipments, which were placed in our car houses at points suitable for operation. The cost of fixing up the car houses for the batteries amounted to practically nothing. The batteries were contracted to be installed in ninety days. They were in working operation in that time. They carried us through the winter and gave us all the additional power we required. We worked them very hard, and, while we put in battery plants for the particular reasons cited, we found an additional reason for their continued use irrespective of the original purpose. It was this: With the running of large cars, sometimes three to the block, and sometimes with a block covered by cars heavily loaded, we could not, with the best system we had, keep up our voltage. At intervals the voltage would not remain, due, probably, to an inferior half ton of coal or so that went under the boilers, or some other reason. This fact reduced very materially our speed, and consequently our carrying capacity. As you all know, on some very heavy lines we have a fifteen-second headway in the busy part of the day, and any decrease in speed means practically a congestion on that line. By the aid of the batteries we were able to hold a constant 550 volts. Such depreciation as appeared was due to the fact that the manufacturers limited themselves in the weight of the plates. At the present time the batteries are running as high

as 600 lbs. and 700 lbs. to the horse-power. We have found, then, that there is practically no deterioration of the battery at all as to capacity, even with the batteries worked hard. We know this from the fact that we have taken the batteries apart and moved them to other locations. They were simply set up at first for an emergency, but at the present time we are equipping nearly every rotary converter station with them. We have, also, very large batteries at our large power station, and we will add, during the next year, about a million dollars' worth of batteries to that plant..

The paper by Mr. Barnes, on "Brakes for Electric Cars," was then read by Col. A. W. Cole. It was published last week.

Mr. Vreeland.—As a member of the association and member of the executive committee, I want to thank Mr. Barnes for the valuable paper he has placed before us, and I want to call special attention to one point in it, and that is the question of proper inspection. That this is not properly done by a majority of the roads is very thoroughly understood. I had occasion, a year or two ago, with Mr. Barnes, and at his request, to look at a railroad that is operated under very severe conditions, and they claimed to him that they had satisfactory appliances which would stop their cars in case of an emergency. We picked out a car at random and tested it, and the emergency part of it would not work at all; we could not make it work. I think we examined three or four cars and not one of them worked.

There was an accident in a certain city a few years ago which I was called upon to look into. The cars were equipped with emergency attachments, but you could take any car at random and make an effort to throw the automatic device, and it would not come within 5 ins. of the point where it would be of any utility. Not but that it was perfect when it was installed. but from the fact that it was only to be used in case of an emergency, possibly only once in a year, nobody paid any attention to it. A large proportion of the accidents due to defective brakes will be found, on close investigation, to have been caused by careless or improper inspection, or possibly to no inspection at all. The best rules in the world we can formulate for the government of our motormen will be worthless if the motormen are not kept up to the rules. In the same way, if the inspectors do not do their duty, there is absolutely no safety in any brake we may put on, no matter how much money we spend on it.

Mr. Carpenter.—I think most of you know the short line that we have at Ithaca. We have a good many very bad curves and some very severe grades, and the question of the emergency brake has been discussed by us a great many times. Nevertheless, I have practically come to the conclusion that even on our line emergency brakes are not of much help. I think the only severe accidents we have had on hills were aggravated at least by the use of a shoe-brake. While, in many cases, the shoe-brake or emergency brake has not worked at all when we have called upon it, in these particular cases it did work, yet the car went a long distance, and did a considerable amount of damage. It has seemed to me that, unless we have something for emergency use which is also in everyday use, it is pretty certain to be of no value when the emergency comes. We are running cars about 18 ft. in length with hand brakes. Recently we have had the motormen trained in operating the motors as generators, so that, in case of an accident to the brakes, and as a last resort, they can employ that method, and it promises better for us than any emergency brake which we have tried or with which I am acquainted.

Mr. Morgan.—During the past year we have equipped our road at Niagara with the Price friction brake, and I am glad to say that thus far it has been very satisfactory. I take a certain distance of road and I require that nothing shall be used but the hand brake; on the rest of the road we allow the friction brake only to be used so as to keep both of these brakes in good condition.

The convention then adjourned for luncheon, to meet at 2:30 o'clock p. m.

TUESDAY AFTERNOON SESSION

The President.—The first order of business will be the discussion upon the remarks made by Mr. Vreeland last year on "How to Increase Efficiency of Employees." Mr. Vreeland has nominated Mr. Connette to speak first on this subject.

Mr. Connette.—I submitted a short paper at the last meeting of the New York State Convention on this particular subject, and that, to a very large extent, covers my views in regard to how we can promote and increase the efficiency of our employees. Discipline is defined as follows: First, subjection to rule, submissiveness to order and control; second, training to act in accordance with established rules; third, the treatment suited to a disciple or learner, education, development of faculties by instruction and exercise; training; fourth, correction, punishment inflicted by way of correction and training. The United States army has rules and regulations which govern the conduct of soldiers, and I believe that perhaps mistakes are sometimes made by endeavoring to apply military discipline in the government of employees of corporations. The United States army, of course, can enforce its discipline by law, with a penalty of imprisonment or, perhaps, a more serious punishment, while with corporations that is not the case. You can discharge a man for the most severe act that he might possibly commit, but a discharge to some men does not count for much. I would define discipline as applied to private corporations something like this: First, obedience to rules and instruction; second, recognition of authority; third, zeal and diligence in obtaining proficiency of performance; fourth, treatment by means of correction for any infraction of the foregoing stipulation.

I think strict obedience to a few rules is proper discipline. It is, perhaps, a fault with a large number of us that we have too many rules which we fail to enforce. It is the policy of some to issue rules containing ambiguous sentences, and winding up with threats of discharge or suspension, which are never enforced. They consequently amount to nothing more than a scare-crow, and any rules that are issued for the purpose of a scare-crow do not tend toward good discipline. I think that all rules and regulations should be in plain, simple language; there should be only a few, and those rules should be enforced.

The most important matter though, I think, is the question of how to handle the men. Some men when they are placed in charge as foremen are liable to allow their stomachs or their ill-temper or their bad judgment to govern. Men sometimes, when they come out in the morning, are afflicted with, perhaps, a case of indigestion; they do not feel good, and they take out their spite on some particular employee; and we should, as far as possible, it strikes me, in the handling of our employees, not allow any ill-feeling, or any ill-temper, or any favor or prejudice to govern or to bias us in trying to enforce the discipline of the road. All men are not constituted to manage men. Mistakes in appointment of foremen or men in authority who are not capable of administering justice and equality are many times the source of unrest, discontent and disturbance among employees. Some men have the capacity to govern and direct, but are not equipped with that diplomacy and conservatism necessary to obtain the best results.

Another thing that should be considered in the handling of men, in my judgment, is that we should not only be governed without prejudice or favor, but we should recognize merit as well as neglect of duty. We are all of us too anxious to find fault, to criticize, to reprimand, and if we were just as equally anxious to commend, to say a good word to an employee when he does his duty faithfully, honestly and conscientiously, we would, perhaps, create a better feeling among the men, because they would recognize that merit and ability were noticed as well as infractions of the rules or neglect of duty. When a man feels that when he does his duty it is recognized, you get the best result; that is, when you have got the men co-operating with you, when you get the men in the state of mind that they feel that the interest of the company is their interest, when they feel that the success of the company means their success.

As to the penalty for infraction of the rules I believe that it should be administered in such a manner as you would like to have it inflicted upon you were you in the other man's place. For instance, if a superintendent or general manager or any other officer who has control of men, sees an employee violating a rule or doing something that he ought not to do, he should call his employee to him at a proper time and say to him he had violated the rule. He should speak to him as man to man, and convince him that he had trespassed upon the discipline of the company, and that he should be punished for it. Then when you do that it strikes me that that man's record ought to be taken into consideration; if he had been in the employ of the company for a long time, and has served the company faithfully and honestly in the discharge of his duties, and this is his first offense, I think that that should count for much as to the amount or the extent of the penalty which should be inflicted upon that particular employee. We can not, in my judgment, make rules of punishment that are applicable for the same offense to the entire corps of men, because we must recognize service; we must recognize that men are not infallible, and that some time or other they will go wrong. But if it is the first offense, or even a second offense, we should recognize in that man the duty which he has performed prior to this time or prior to the time that he had committed the particular offense, and let that govern us in the penalty which we should apply for the particular offense which he has committed.

The President.—Mr. Root will discuss the topic, "Benefits of Associations."

Mr. Root.—The Metropolitan Street Railway Association was formed in the spring of 1897, with a membership of about fifty, and from this it has steadily grown until to-day it has a membership of

over four thousand. The dues are 50 cents a month, which is the onnly expense to which its members are liable. It pays a sick benefit of $1 per day, with a maximum amount of $90 in any one year, and a $150 death benefit to a beneficiary stipulated in the agreement, which is signed by the member upon entering the association. It has a library of 2000 volumes, donated by the company, which is free to the members and their families. It has a physician, whose services are free to members, and who is subject to call at all times of the members, either at the company's depots or at the members' homes. It has a bed in St. Vincent's Hospital, given by President Vreeland. It has six pool tables, located at the different depots, given by a director of the company. The general manager of the company is the president of the association, the treasurer of the company is the treasurer of the association and the secretary is a special officer, appointed by the president of the association. The board of trustees consists of seven members—the president, three appointed by the president, and three elected by the members of the association at the annual meeting. The only salaried officer is the secretary, who is paid by the company. The association has paid during the five years of its existence over $60,000 in sick and death benefits. The association gives annually a picnic and a ball, from which $2,000 each year, on an average, has been turned into the treasury of the association. Meeting rooms, library, pool rooms, etc., have been furnished by the company. The association is under absolutely no expense, except the payment of sick and death benefits and the stipulated salary of a physician. The company gives to the members of the association, annually at Carnegie Hall, an entertainment, at which the highest class vaudeville artists appear.

The benefits derived from such an association may be divided into two classes: (1) The benefit derived by the employee, and (2) the benefits derived by the employer. There is nothing which probably appeals more strongly to the large majority of people, certainly to those who have to work for a living, than those things which yield a direct or indirect financial return. No one can fail to see the great benefit which the distribution of from $10,000 to $15,000 a year means to the men who are working for wages, on which, at the best, they are only able to support themselves and family in times of health and prosperity. Besides, the service of a physician, the free use of a library, the opportunity to play pool or billiards in a well-lighted and well-ventilated room at the nominal cost of a cent a cue, are indirect financial benefits as well as pleasures, which are bound to be appreciated by any body of intelligent workingmen, such as are employed by street railway companies.

The second class of benefits from these associations—the benefit to the employer or stockholder—is not so tangible as those received by the employee, but, nevertheless, exist, to a large extent, and are apparent to those who are closely in touch with the workings of such associations and their bearing upon the management of the company's affairs. It may be difficult to demonstrate to an outsider, or to put your finger upon particular cases, where the use of the library or the association rooms or the pool tables accrues to the advantage of the company. It is unquestionably true to my mind, however, that all of these things create a certain sentiment in the mind of the employee favorable to his employers, and which in times of labor troubles, when the misguided and unscrupulous agitator attempts to cause dissatisfaction, crystallizes into a feeling of loyalty toward the company, which could not have been gained in any other way. At the monthly meetings of the Metropolitan Association, which are held in the association rooms, and at which men of prominence, and officers of the company, speak to the men, the employer, as represented by the officials of the company, is brought into a personal relation with his employees, not as employer and employee, but as man to man, and in this way there is established a personal relation between them, and a feeling of friendliness which certainly, in a large company like the Metropolitan, is not possible in any other way. I believe, as illustrated in the late trouble in Dayton, Ohio, which the National Cash Register Company had with its men, that it is possible to overdo this character of work. I do not believe, however, that we have done this in New York, and as an illustration of the spirit in which the men have accepted these innovations, one of the pool rooms, located at Fiftieth Street and Seventh Avenue, takes in, on an average of $45 a week. Several games of pool at a cent a cue must be played in the course of a week to make the receipts of a room $45.

There are, to my mind, three predominate problems in the handling of a street railway property. First, is the relation of the management to its employees; second, its relation to the public and the press; and, third, its relation to the State and city officials. Of these, the relation of the management to its employees is of the greatest importance. However unjust it may be to the responsible head of any street railway property, nevertheless how often has it been the case that the faithful and efficient work of years has been practically forgotten and nullified by differences which have arisen with the company's employees. The fact that a manager has been able to operate his road at a less cost than ever before, and has brought the standard of equipment and the roadbed and entire physical condition of the property to a higher level, is apt to be overlooked by the company's directors and stockholders in case serious labor difficulties arise. I believe that the interest the employees take in a financial investment of 50 cents a month in an association, and the enjoyment of the opportunities afforded by the libraries, pool rooms and entertainments, etc., together with the personal contact between the employees and management, brings about a relation between them similar to that which the millions deposited in savings banks bring about between citizens and their government. I think, with rare exceptions, that there will be found among the savings bank depositors but few anarchists, socialists, or those who are dissatisfied with existing conditions. The millions of savings bank depositors are one of the strongest influences toward the proper government of any country, and I believe that the financial and other interests of employees in a street railway company, through their association, are equally strong influences for good.

We are living in an age of progress in which no industry has made more rapid strides than the street railway. What was considered ten years ago a liberal policy on the part of street railway companies toward their employees would be considered conservative to-day. The methods of ten years ago have become obsolete, and can not be used effectually at the present time. The relation of capital and labor, as represented in street railway properties, has undergone a radical change in favor of the condition of labor. The betterment of labor conditions has been just and fair, and, in my opinion, any street railway management will do well to recognize it and meet it with liberality. There is no better way of keeping abreast of this movement than the encouragement and fostering of mutual benefit associations.

I have heard managers of street railway properties ask the question, which is a heritage from the old street railway days: "Aren't you afraid to allow your employees to get together and discuss the affairs of the company and their feelings toward their employers." I unhesitatingly say that I believe that every street railway company should be in a position to say, with the Metropolitan Street Railway Company, that it has nothing to fear from its employees assembling together. There are many things that are necessary in order to establish proper relations between the management of a company and its employees, but I believe that the most potent factor of all is the benefits received by the employees through an association and the relations which the social side of such an association establish between the management and its men.

THE PRESIDENT.—Mr. Wheatley will now discuss the selection and training of employees.

MR. WHEATLEY.—Without going into the generalities, I want to give you a leaf out of my experience in the selection of men, as I think that these conventions ought largely to be statements of experiences; and we can get the most out of them when each man comes here and tells his own practical experience. In the selection of our conductors and motormen we require each of them to state in his application where he has worked, what he has been doing for the past five years, and to give the names of three or more reputable persons to whom he can refer, or bring from such persons letters of recommendation. After that has been done we have an investigator go to the address given by the applicant to ascertain whether he lives at that address, and what his neighbors and acquaintances in that vicinity have to say of his reputation and his character. In the case of a man who comes to us from a distant city we naturally can not do this directly. When we become satisfied of the fitness of the applicant in that respect he is sent for and is then put into the school of training. Our system of training is different for conductors and motormen. The conductors are first assigned to a division on which there may be several lines; on each of these lines he is required to go with one of the most competent men we have in the service and make a stated number of trips by day and by night, to be certified to by that man, as well as by the line inspector in charge of that line. In training our motormen we pass them through the same experience as conductors, except that before they are assigned to a division they are sent to our electrical inspector. He is provided with a school car which has trap doors, exposing the motors and the gearing; it is also provided with ammeters and voltmeters, and the applicant is there given as much instruction as he can receive within a week or ten days' time. The instructor then certifies to his competency, and he is recorded as No. 1, 2, 3 or 4. He is then assigned to a division and lines in the division in the same manner as a conductor. When he is ready for work the division superintendent takes him in hand, and about the first question he asks him is: "Have you a copy of the book of rules; if so, what would you do in this case or that?" In this way the superintendent goes through the main points in the book of rules

to ascertain whether the applicant has made himself sufficiently familiar, not with all the rules, for that would be impossible within two weeks' time, but with the main safety rules. Having satisfied himself that the prospective employee sufficiently understands his duties, the man is put upon a car. Upon being assigned to work he is still kept under the surveillance of the inspector of the line on which he is running until that inspector is satisfied that he is fully competent to operate a car. This brings us up to the point of the discipline of our men.

Discipline, as Mr. Connette has told you, is only another name for training. The weak spot in most of our systems is the insufficiency of training that we give to our men before we permit them to operate a car. In the twenty-five years that I have been connected with steam railroads I have known of no case in which the superintendent of a steam railroad would consider a man competent to go into the train service, and would call him broken in as a competent man, until he had been there at least six months or a year. In the administration of discipline I agree entirely with one of the previous speakers who said that you can not make a hard and fast rule to be applied to all men at all times for the same offense. You must take into consideration the individuality of the man and the effect that you want to produce upon his mind. There are times when ten days or thirty days must be given in order to make the necessary impression, for there are some men upon whose minds you can not make an impression by talking to them.

It was said in one of the discussions to-day that it was one thing to make rules and regulations and another thing to know that the men always obeyed them. That is another point in the training of the men in which I think we should all be exceedingly careful, *i. e.*, not only to provide them with the necessary rules and regulations, but to have such a system of inspection as will enable us to know that the rules and regulations are obeyed.

We have another condition in Brooklyn which I think is rather peculiar to our system. Our excursion business in the summer makes it necessary for us to hire some 1200 to 1500 new men every spring, and we have to put them on the road at the rate of from 300 to 400 a month. We commence the first of April and we do not get through until July. I would like to have you realize what that means in the operation of a large system. A short time ago I asked an officer of the Ontario & Western Railroad Company how many train men they had in their entire train service. He told me they had 480. Some of our larger railroad systems do not have more than 1200 to 1500 men in their train service, and I dare say that not one of the officers of any of those roads would look upon the situation of breaking in an entire new force on his road without a great deal of fear and trembling; but that is what we have to do in Brooklyn each and every spring, and we will not get the same men next spring that we had this spring.

There is another fact that is peculiar to street railway operation as distinguished from steam railroad operation, and which has a very important bearing on training of the men and the efficiency of their work. On steam railroads the train crews are always organized so that a new man goes with an old crew. It is possible in their system to do it. On street railways, where we are governed strictly by seniority, all of the old men, that is, the regular men, have their regular runs. Then there comes a call for fifteen or twenty or fifty additional cars to go on certain lines of the system, and the only men that we have to handle those cars are the extra men—the new men. It, therefore, becomes necessary to send out a new conductor and a new motorman on the same car. It is not considered good practice to do that, but we have never found a way in handling our seniority list to avoid it.

To sum up the discussion in regard to the selection and training of our employees, I think you will all agree with me when I say that what we want to strive for, and the means by which we will attain the best results are: to exercise the greatest care in the selection of the men; to train them as long and as well as we can; to weed out those that do not measure up to the standard, and then to keep the balance as long and as continuously as we can. Continuity of service with good training is what gives us good results.

Mr. Cooper.—I would like to ask Mr. Wheatley one question: What is your practice in selecting men, as regards taking men that have been employed on other roads? Do you make any difference, supposing that the men are equally as good?

Mr. Wheatley.—Our practice in that respect is that we always prefer to take an experienced man when we can get him, provided his record on the road where he previously worked will permit it. I have known many cases where motormen on another road would make a mistake, causing an accident, and the requirements and discipline of that road would not permit it to retain them in the service. When I can become satisfied that there is nothing else against that man I would have no objection to giving him a trial on my road. In case of men who have been dismissed for serious offenses, like dishonesty, we would not accept them under any conditions. But I do believe that where a man has made a mistake, if he realizes the seriousness of his error, he often makes a better man that he was before.

Mr. Shiplin.—I think roads take big chances in hiring experienced men from other roads. A good man will hold his job, and he is always sure of it. We have had that experience on our little road. The first gang of men we had were experienced men; they were reckless, and we had a very serious accident. I think I had rather take a healthy, intelligent, new man and train him. I think he is the most faithful.

Mr. Vreeland.—As you know, last year I spoke on the subject of discipline and on the advantage of mutual benefit associations, etc., and, as a result of my remarks, there was considerable discussion on the subject. The theoretical side of the question is one thing and the practical is another. Nothing has been advanced by our Mr. Root with reference to the mutual benefit association work but has had its practical illustration in the working of it as a system in our great city. What Mr. Wheatley has stated about his method of training his employees is, in most respects, identical with ours, with the exception that we adopted four years ago what is known as the Brown system of discipline. Out of 190,000 miles of steam railroads in the United States, 100,000 miles under the control of various systems have adopted that system. The evolution of steam railroading has been one of scientific progress, and at the present day it is the result of half a century of experience, and nothing is done theoretically. Everything is studied in its practical workings. I worked on a steam railroad under the Brown system of discipline. It was claimed by a number of street railway managers whom I have talked to about it that it was impossible to handle street railway employees under that system. It was claimed by our division superintendent that it was impossible four years ago. If one of you gentlemen go to New York City to-day and take charge of 10,000 employees of the Metropolitan system and advocate to the superintendents the doing away of that system, every one of them would stand up and fight for it to the last breath. We have absolutely no system for suspension. We suspend no employees under any circumstances. If an employee does anything that is worthy of a thirty-day suspension we discharge him. We have a record system, and a man stands or falls by his record. He is so advised when he enters the employ of the company. For every infraction of the rules investigation is made with the man's record in front of the investigator. The other system frequently makes it necessary, in the interest of discipline, to discharge men whom you would a great deal rather keep. I was in a railroad office making an investigation of a system not very long ago, where there was an order on the bulletin to the effect that any violation of a certain rule would result in the immediate dismissal of the offender. We do not allow any orders to be placed on our bulletins that carry with them any penalty. We put them up to be observed. If they are violated we administer the character of discipline that is necessary. To threaten discharge used to be the old steam railroad system. It has been done away with entirely, because the first man that unfortunately, perhaps unconsciously, violated that rule might be one of your best employees. Probably he might be a man who had been with you for twenty years, who had run your fastest express, a man in whom you had every confidence, yet you had either to discharge him under the circumstances or you could not discharge the next man that violated the rule in question. I consider an employee's length of service, and take into consideration his record. It is so exceptional for a man that has been six months in our service to be discharged, that a special report is always made to me of the fact, and the man's record sent to my office. These records mean a great deal to the men.

It is sometimes said that political influence has a great deal to do in making appointments of men. One of the judges of our Supreme Court in New York City two years ago made a personal appeal in behalf of a man who had been dismissed. He said he had known this man for years; that he had a large family, and he personally appealed to me to put this man back. I had a typewritten copy of this man's record before me, which showed that the man had been warned three times for an infraction of the rules before he had been dismissed, and the third time he received notice that the next time it occurred it would result in taking his name off the books of the company. I sent this record to the judge, after writing on it in blue pencil, "After reading this record if you will write a letter to me requesting me to reinstate this man on your responsibility I will put him back on the road." The judge returned the paper, after writing across the face of it, "The man ought to have been discharged six months ago." We have those records in such shape that when anybody who is be-

hind a man comes into our office I always say to him: "There is the record; we were justified in discharging that man, as you can see."

So far as the question of training is concerned, the training of employees continues as long as the employee is in your employ. A steam railroad conductor who has been thirty years in the employ of a company is just as much in training to-day as he was when he started in to work. It is the same with an engineer. Every new question that comes up is a new training, or a character of training on subsequent lines of duty. The training of every employee is continuous. I have talked with a number of managers of street railways in the United States who said it was impossible, upon a medium-sized road, to adopt the system of instruction of employees that we have, because of the character of their service, because they employ so many new men in the summer that they can't give the time to it, but I tell you that 50 per cent of the total force on our system has been recruited in the last four years, and every one of them has gone under that course of instruction.

With reference to the point of hiring new men, I think that is the greatest mistake that is made. We try to impress upon our men that when they lose their positions with us they have lost something. Our effort has been to pay such a rate of wages, to make such arrangements for their comfort, to make the reserve benefit fund almost a part of their home life, and to make the influences that surround their work of such a character that any man who loses a job knows he has lost something that he can not get somewhere else. In steam railroading, if a conductor loses his position to-day, what does he lose? He loses everything. He can not go on any steam railroad and get a job as a conductor, or, if he does so, it is simply as an extra man at the bottom of some list; he takes no priority over anyone else. It is the same with an engineer. Half of the engineers and conductors that are discharged for infractions of the rules of steam railroads to-day are firemen or brakemen on another road. They have lost something; they realize it. Make a man's job worth so much to him that he will attempt to keep it. I have known a great many cases where a man has been hired because he was an experienced man on some other road, and was made superior to the new men on the road on which he was hired. No man with us takes any position other than the lowest grade position; it is immaterial where he comes from. I mean that if there are one hundred extra men on the road, and a man who has had four years' experience on some other road comes with us, he is No. 101 on our extra list, and he has got to work himself up. The great trouble on many large systems is that there is absolutely no system for the promotion of the men. I know of one division where the men regularly paid the starter so much apiece to get a good run right over the heads of other men, and I found the same condition of things in the extra lists on other lines of our system before they came under our control. When I assumed charge I found that if any man curried favor with the starter he could get the first good run there was to give away, irrespective of his position. We now run under the locked system; that is, we have the names of the motormen and conductors put in a box, and no one can change them but the head man. Every man knows his position. With reference to the best run on our system to-day, if it is No. 1, and if the man who had it was discharged or left it, an extra man is put on that run for the balance of the week. It is reported the last of the week by the starter to the inspector and by him to the division superintendent that that run is vacant. An order is bulletined that run No. 1 is vacant, and the men who want it can make application for it in the order of their seniority. If the man having run No. 2 does not want it, the man having No. 3 can have it, and so on. When the change is made, the list is unlocked and the order is changed. The new No. 1 man knows his rights, and no starter in the system, or any other man, can take it away from him. The same is true of the extra list. Our extra lists in New York were run entirely, seven years ago, by influence. A man could be No. 25 on the extra list, and if a day run was to be given away he could just as well get that run as the man who was No. 1 on the list.

The benefit association in connection with our system in New York City I consider one of the most valuable adjuncts of our business, and the faithfulness and the loyalty of our employees is a matter well known to those of you gentlemen who are in and about New York. I asked a man who said to me that he did not see any advantage in mutual benefit associations: "If you want to talk to 1000 of your men how can you do it unless you talk to them individually?" He said: "I can't; there is no way of getting at it." I said to him: "I can bulletin a notice around on our division bulletins that I am going to talk to our employees next Saturday night at 8 o'clock, and our association rooms will not hold the men who will be there to discuss all character of questions. We discuss questions of discipline and railway management, and any question which affects the general condition of the service."

MR. W. W. COLE.—Two years ago I put the Brown system of discipline into effect at Elmira, and among the many advantages there is one special one, and that is, that where a man is laid off for twenty or thirty days, as is the case under some of the other systems, he is apt to acquire idle habits; he is also very apt to run into debt. His family suffers unjustly through no fault of theirs, and after the man is placed at work again his creditors begin to harass him and annoy him until he becomes careless in his duty, and eventually you lose the services of what otherwise might have been a good, efficient employee. In addition to recognizing any violation of discipline we keep a ledger recording all the merits and good acts that the man has done during the year. At the end of the year the man who has the greatest record account in his favor gets ten days' vacation on the company's time; the second best gets a week, and the third, five days; and the men who take a vacation on the company's time seem to enjoy it very much. There is another point especially that favors the use of the record system at Elmira; the consolidation, which exists there of the waterworks, gas companies, electric light companies and the railroad companies. We have it divided up into different departments, and a man who can bring in information to the company which will increase its business in any department or in any way helps the operation of those departments is given a certain number of merit marks. I have found that motormen and conductors have been able to pick up more business than those in any other department, and also in giving notice of any leaks or breaks in the pipes, either gas or waterworks, for which they also receives a merit mark. The system, I know, is very much liked among the men over the old system of giving them their lay off, and I do not think if it was left to the vote of the men they would ever go back to the old system.

MR. WHEATLEY.—I would like to hear the experience of some of the other gentlemen here who have labored with this question of hiring and training new men. I would like especially to ask those gentlemen who have the Brown system of discipline if, in case the new men, who must necessarily learn by experience, have accidents, violate a rule or are sometimes perhaps a little reckless and careless, are they given the same demerit marks as the old men?

MR. COLE.—I think that you can not have any iron-bound rule; you have got to use some good business judgment, and to make the punishment fit the crime. The new men, of course, are more leniently judged than the older men who have had the chance to study up the rules and regulations, and, in fact, have had more experience in the entire operation of the road. In our system, at the end of six months we have an examination blank, which is sent out to all the extra men. They are called into the meeting room and have to pass this examination. An extra man that can not pass the examination is put back for instruction on the road again.

MR. ELY.—I had rather a novel experience. A discharged man was recommended by a member of Congress for reinstatement. The recommendation came to me, and the superintendent of that division brought his record down, and I was particularly desirous of placing the matter frankly and fairly before the Congressman, as I was a good friend of his; so I sent him a copy of the record, and I asked him what he thought about reinstating that man after reading his record. Instead of writing me, as the judge did to Mr. Vreeland, the Congressman handed this communication over to his secretary, who, with equal promptness, handed it to the man applying for reinstatement, and he promptly sued me for $2,000. (Laughter.) The suit is still pending.

Two years ago I was much impressed by what Mr. Vreeland and some others said at Ithaca about benefit associations, and I went right back to Buffalo thoroughly convinced it would be a good thing to have, and after talking it over with the general manager, who agreed with me, we started out to effect such an organization. We were to have an exposition in that city, and that seemed to throw more difficulties in the way of the scheme than would usually be the case. There seemed to be a feeling among some of the men and their families that there was some ulterior object, but at certain meetings which we had with the men and their families through the medium of outings and excursions we were giving, the matter was explained carefully and a committee of twenty-five conductors and motormen was appointed. These men examined the rules, the by-laws and the constitutions of similar associations in New York, Binghamton and elsewhere, and finally compiled a constitution and by-laws. The organization was effected, and to-day we have about 1200 members. The men are in favor of it, and the women of their families as well. We fitted up very nice association rooms with a large

gymnasium well equipped, about 800 lockers for gymnasium purposes, five shower baths, bath tubs, closets and all conveniences, a handsome parlor, smoking-room with long tables for reading, all the periodicals, especially journals pertaining to electricity and street railways, and a large room in which there are pool and billiard tables, card tables and conveniences for the playing of amusing games. These rooms are frequented by the men. They pay 5 cents apiece for a towel and soap for the bath, and take anywhere from twenty-five to fifty baths a day.

The scheme of organization is about the same as that described by the representative of the Metropolitan Street Railway Company. It has not been self-supporting financially as yet, but we are on the way toward that. I think we made a mistake by putting the dues at 40 cents a month; it should have been 50 cents. The representatives of the men figured it out that 40 cents a month would do, and we concluded to try it because we could raise it if necessary. I think it will have to be raised to 50 cents. We met with a question that any of you would naturally meet in so many such organizations, that proved bothersome at first, but we solved it. That was, there were a lot of employees in that system who had passed the age limit, but they had been faithful men, were at work for the company, and wanted to join the association. We met that by establishing an honorary class, and the company made good any deficits there were in that class, which would naturally occur because of there being so few men in that class. If a man dies $150 is paid to his family, and there are so few men in the honorary class that 40 cents a month does not meet those requirements. The company pays these extra dues, makes good any other deficits for rooms, supplies, books, etc., and all the operating expenses, so that the amount of money that is paid in by the men goes for the purpose of providing a sick and death benefit fund. I think I may say, without any reservation whatever, that it is a very beneficial institution. It tends to make the men acquainted with those connected with the management, and this puts them in a very different frame of mind concerning the corporation. As illustrative of the type of men that we are getting and the effect that these influences have upon the minds of the men, I would say that one of our directors, Francis Lynde Stetson, on a certain occasion sent us a check for $100, saying that he would like to have me use that in such a way as I thought would be desirable for the benefit of the association. So I brought it up at the meeting of the board of trustees, composed of conductors and motormen, so far as the elective part of them were concerned, and asked: "What shall he buy with it?" And they said: "Let us buy a piece of statuary." So we bought the crouching Venus and put it up in our room, and everybody that comes in admires it as much as I do.

Mr. Connette.—The Syracuse Railway Company is a comparatively small company, when we speak of the Buffalo or New York City roads, but we have a benefit association there organized on the same lines as the other are. The company pays for the rooms; they are equipped with all the paraphernalia, including the daily and weekly periodicals, and the association has $500 deposited in the savings bank drawing interest, and perhaps $300 or $400 in the treasury to draw on.

Mr. Vreeland.—Before this discussion closes I want to say one word on that side that Mr. Ely was talking about, and concerning which Mr. Connette spoke. There have been some of those associations formed around the country that failed. Men have come to talk to me about it, and within a year a man out West, who is manager over a large number of employees, and who had started a benefit association, came to me and said that the association had been a failure. I said to him: "I do not know the circumstances, but I will tell you why. The night that the association opened you appeared there and had something to say; have you ever been there since?" "Oh, no," he said; "I am too busy; I have not got the time." I asked: "Has your vice-president been there?" "Oh, no," he said; "he wouldn't go there." "Has your general manager ever been there?" I asked. He replied: "No, I guess not." I asked: "Who runs this thing?" He answered: "Oh, the men run it." I said: "We make our association just as much a part of our organization as any of the executive or any other work of the company. There has been scarcely a meeting since the association started at which, unless I was ill, I was not on the platform. I never make any other engagement for the night of the association meeting; no matter how inconvenient, I attend the meeting. In that audience you can look out and see in the same rows with the men all of the officials of the road, who feel as much interest in the meetings and who feel it their duty to be there as much as I do. And you, gentlemen, well know that the fact that the leading officers of the road are going to be there has its influence on the employees. There are men there to-day that I know personally, know their names and can speak to them on the street, whom I did not know at all before they came into the association. I would see them passing on the cars, but there was no opportunity to come in contact with them. If you are going to consider a matter of this kind, outside of the railway proposition, I advise you do not try to run it."

Mr. Root.—I would like to say, in the way of suggestion, a point which I should have included in my paper had I thought of it, that the Metropolitan Company turns over to the association every year the proceeds of the sales in the lost articles department. This amounts usually to about $2,000 a year. Since the inauguration of that system that department has yielded to the association about $6,000. I merely mention this as an incident of the company's interest in the association.

The President.—I don't know whether the road which I represent was the first one or not, but we started an association in 1889. That association included all the electric interests in Binghamton, the electric light, telephone and telegraph companies, as well as the railway company. I will state that it was a failure. It kept up for about two years, got in debt, and then went all to pieces. One Sunday morning one of the men came to the office and wanted to know if they could not start another; they thought it would be a success if they could run it alone. I told him I would be very glad to have them start again, and asked him to let me see their by-laws. I told him to come back in a few minutes. A committee from the men returned, and I said to them: "I want the pleasure and privilege of putting the first money into the treasury." The result of our association has been phenomenal. Our road is a small road, about 40 miles, and to-day there is not a claim against the road or a lawsuit except one, a case that has been tried and sent back for a new trial.

The President.—We have one thing to do yet before we adjourn for the day, and that is the appointment of a committee for the nomination of officers.

Mr. Wheatley.—I move that a nominating committee be appointed.

Motion seconded and carried.

The president appointed Messrs. Wheatley, Morgan and Root as such committee.

The convention then adjourned until Wednesday morning, Sept. 11, 1901, at 9:30 a. m.

WEDNESDAY'S SESSION

Convention convened pursuant to adjournment.

The President.—We will now listen to the reading of a paper by Le Grand Brown, of the Rochester Railway Company, on "Steel Tie Concrete Construction." (This paper is published elsewhere in this issue.)

Mr. W. W. Cole.—Outside of New York I have a little railroad, the Suburban Northern New Jersey. We have been putting up two bridges, and we have built our bottoms entirely of concrete, and found that it gives excellent satisfaction, especially in a climate like New Jersey, where it is freezing and thawing almost constantly through the winter. In regard to the steel ties, the Erie Railroad Company has been trying an experiment at Elmira. It has taken some old T-rails and bent them bottom side up. Two rails are bent where the rails come together, and the other two are spread at the outside ends. Up to date it has given very good satisfaction with the exception of the clips, which come loose. There are several instances where the company has used vulcanite to keep the clips about the locknuts, and this has made them strong enough to stand the jarring strain that is brought upon them.

Mr. Brown.—We are putting the ties 10 ft. apart on straight track, and from 3 ft. to 5 ft. on curves. The first we put in were about 6 ft. apart, but we found this distance was really unnecessary, especially with a rail of a wide base. We take particular care to tamp thoroughly under the base of the rail, depending more on the base of the rail to support it than on the tie. These ties cost about $1 apiece.

Mr. Nicholl.—The main idea in this class of construction is that we can get the concrete right up against the web of the old rail, something that you can not do in a channel tie, and that holds the track down, you understand. While there is no movement up and down, you do not need anything between as a pusher. The very thing that we try to avoid is a cushion of any kind. We made a mistake in putting asphalt under a portion of our track on West Main Street. We find that it does give a little bit, and allows the joint to fill up, and in a short time it breaks it loose.

The President.—Are you laying the asphalt against the rail?

Mr. Brown.—Not unless we have to; and the city engineer agrees with us on that subject—that it is a mistake—so I do not imagine that we will lay much more of it. In some cases we have used brick in between the tracks, and then a toothing across outside, and asphalt outside of that. It is a mistake to lay any asphalt against the rail, no matter how heavy the rail is.

Mr. Ely.—There is always some slight motion of the rail,

enough to cause a little breaking away of the asphalt; then water runs in and freezes and thaws and breaks the asphalt, which then disintegrates and goes to pieces. We use block stone toothing wherever we put the asphalt. Wherever we are required to put the asphalt in between the rails of the tracks we use the stone toothing. We believe that, although more expensive in the first instance, it is true economy not to put the asphalt in between the tracks or the rails of the track, but to put in first quality block-stone pavement.

MR. SHALER.—What supports the rails between the ties?

MR. BROWN.—The concrete, which is about 14 ins. in width, a solid beam thoroughly tamped underneath the base of the rail. With the asphalt against the rail, the latter, you may say, is perfectly solid, but the effect of the temperature on that rail and on the asphalt is, sooner or later, to make an opening.

THE PRESIDENT.—We will now listen to a paper by W. J. Davis on the subject, "Use of Service Boosters." (This is published elsewhere.)

THE PRESIDENT.—Would anyone like to ask Mr. Davis any questions? If not, the next order of business will be the consideration of the rules submitted by the rules committee. If you have not a copy of these rules, they are on the table here, and I will pass them to you.

MR. CONNETTE.—The committee does not pretend to offer this as a final report. It merely submits this code of rules as a suggestion practically to bring out suggestions and recommendations from the members of the association. Mr. Vreeland very well said yesterday that there is no man, or no set of men, that can perfect a system of rules within any short space of time. In my opinion, it requires very mature thought, consideration and experience, and it occurred to the committee that it would be well for each member to look over these suggestions and see if they are applicable to his particular road. If he sees any shortcomings or anything that should be added to these rules, he should either express himself here in convention, or advise the committee in some way, because there will be no final report made at this meeting. The time is too limited even to discuss it in an intelligent manner, and it has occurred to me that it would be well not only to discuss it here for a few moments, perhaps, but for each member to go over this matter carefully and give the committee the benefit of any ideas or thoughts or recommendations that he may have that will be applicable not only to our own road, but to the interests of street railways in the State of New York generally. A copy of this pamphlet has been forwarded to each member of the association by the secretary; I suppose you have all received one.

MR. MORGAN.—In regard to these rules, I agree thoroughly with what Mr. Connette has said, and I was also brought face to face with another important fact in these rules yesterday in the remarks made about accident cases; that is, the effect of a rule as a legal help in a negligence case. During the past year I have gotten out some rules for our road, and in looking over these rules since yesterday I noticed that in my efforts to make these rules applicable to our road, and to have every care exercised by the motormen, that there is that objection to rules in general. These rules, as I understand it, of this committee, are to be the rules of the association, and will no doubt become not exactly the law of the State, but, through the State Railroad Commissioners, will undoubtedly be recommended. I think we should all examine carefully the rules with that idea, that we have got to be protected as regards these negligence cases, and we can not formulate and have as practical, legal, standing rules those which would be detrimental to us in a negligence case. I would, therefore, move that the committee on standardizing a code of rules be continued as a standing committee, and that the members of the association be invited to send suggestions and additional rules to this committee during the coming year.

Motion seconded and carried.

MR. W. W. COLE.—I have just issued a new set of rules and regulations for our road at Elmira, and there is a point which possibly might be covered in the special set of rules, and that is, a motorman taking a car out of the house should be instructed to make his examination. In case he finds any trouble with his car he should refuse to take the car out, but should give notice in writing to the foreman of the shop, and that notice should be on a printed form so that the foreman of the shop could O. K. it before the motorman takes the car out. That would be for use in case of an accident, because in so many accident cases the motorman has testified that his car was out of order, and it was out of order when he took it out of the house, but he gave notice of its condition and no attention was paid to it. I think that all motormen should be furnished with a form of blank, so that any notice given that the car is out of repair must be in writing and O. K'ed by the foreman of the shop.

One other point which might possibly go into the standard set of rules would be instructions to motorman in case of trouble along the line, *i. e.*, general instructions as to what he should do if a wire came down on top of his car, how to handle it without danger to himself or the passengers, and what to do in case of snow blockades in outlying suburban districts.

MR. CONNETTE.—I beg to say, Mr. Cole, these rules put the conductor in charge of the car, and if you will notice rule No. 19 provides that the conductor must report to the foreman or inspector any cars not in first-class condition for service.

MR. W. W. COLE.—As I understand it, the conductors are in control of the car body, including the lights, glass and general condition of the car, but the mechanism of the car would come under the motorman's jurisdiction.

MR. CONNETTE.—I hardly think it is necessary to have both of them make reports. The conductor being in charge of the car, all reports should be signed at least by him, because we hold him responsible. He is in charge the same as a conductor of a steam railroad train, although, of course, the engineers make reports.

MR. COLE.—An engineer makes reports of the mechanical condition of the locomotive. The conductor has not served his time in the shop and does not know anything about the mechanical construction of the car, and I should say that that should come under the motorman's jurisdiction.

MR. VREELAND.—There is one point to which the Railroad Commissioners called my attention, and I agreed with them entirely. I have not read these rules up to the present time, but I have reference to rule 58 on page 17, which does not permit anyone to stand on the step or platform when there is room inside the car. That should be made a rule. Do not allow passengers to stand on the steps at any time. That is what we do in New York.

MR. CONNETTE.—We can make a rule of that kind, but it would be impossible to enforce it under some conditions, especially on small roads where there are very large crowds.

MR. POWERS.—The rule is undoubtedly a proper one, that no one should be allowed to ride on the steps, and as for the motorman being able to enforce it, I should say it is possible. For instance, on the last Fourth of July we had to carry something like 10,000 people a distance of 6 miles, on a single-track road, with an equipment of about six cars. It seems to me it is possible to enforce the rule, because we enforced it at that time. It can be done and is done, and I think there should be a rule that no person should be allowed on the car step or runningboard under any conditions whatever.

MR. VREELAND.—The steam railroad companies do not allow passengers to stand on the steps or the platform of their cars. Every one of us know that there are exceptions to it all through the year, on race days and occasions like those, but the company is protected by the fact that there is no rule in existence to confront it in court which permits a dangerous proceeding of that character. I do not doubt but that roads all over the country have to allow that occasionally; possibly 350 days in the year you would be able to enforce the rule. So far as New York is concerned, we do not allow anyone to stand on the steps of open cars. In fact, the conductor would stop his car and let it stand if anyone should stand on the steps or runningboard and call a policeman, because the danger there is so great, not from a passenger falling off the car, but from passing trucks, etc. Our instructions are very rigid as to that, and I do not believe that we have hardly an accident that is traceable to that.

MR. CONNETTE.—Of course, the traffic on Broadway is immense. At the same time, the Metropolitan Company has ample equipment for the handling of an immense traffic; it is a procession of cars. But you take some of these little country towns like Syracuse or Binghamton, for instance, when they have some large fair or show of some kind in the suburbs. There is not equipment enought to handle the crowd as it should be handled, and it would not pay to have the necessary equipment for emergencies of that kind. Where you have twenty-five or thirty or forty cars in a row, and all the people come out at once, you can, to a certain extent, keep them off the steps, but I have observed that after the steps would be cleared and the car would start a lot of people would run up and get on again. I believe, as Mr. Vreeland has said, perhaps 350 days out of the 365 the rule might be enforced. The only question is whether we want to incorporate a rule that we can not enforce for 365 days. Perhaps it would not be possible to make the rule as rigid as that. The members of the committee are open to suggestions and want to absorb everything they can on propositions of that kind.

MR. BURT.—It is absolutely possible to do it. I have done it on four or five small roads. If you make your rule absolute that the car is to stop and not go on until your runningboards are cleared, the public will soon get used to it. What you might gain in that small way would be wiped out by one accident from your runningboard. I have had little roads that have been per-

fectly swamped with that sort of thing, and the rule was enforced; it is safer to do it.

Mr. Morgan.—I would like to state an incident on the Buffalo road. The rule is imperative that the runningboard should be kept clear on both the Niagara Falls road and the Niagara Gorge road. We are handling this year a great deal more than our capacity. If the passenger on the runningboard refuses to get off, we simply say that the car can not go on, and the result is the passengers make him get off. That is the way we have found it to work, and I think it is a rule that should be imperative and not left to the discretion of the manager.

Mr. Nicholl.—We have difficulty in keeping them off the roof on our road.

The President.—I have had that trouble. They get on the fender sometimes.

Mr. Ely.—I took a party off the roof of one of our cars at Tonawanda. They all came down. They had been up there when the car was going at the rate of 40 miles an hour, and one fellow threatened to lick me when I ordered him down.

Mr. Shiplin.—That rule can be enforced in large cities where there is plenty of police protection, but on a suburban line where there is no police it is impossible.

Mr. Ely.—You can get the Sheriff to deputize your men and make them special deputy sheriffs. You put a deputy sheriff on your line and he will keep order. Have your conductors and motormen made special deputy sheriffs by the Sheriff of your county. He has authority by law to do that, and he will do it.

Mr. Shiplin.—When there is a picnic or anything of that kind it is impossible to control the car. We would need deputy sheriffs and a whole regiment of soldiers to keep them off the car. We had a case once when we had only six cars, and about 1200 people piled on to those cars and smashed the wheels. We did not want to start, and I gave orders to hold the cars until the people got off. One man jumped off and was going to lick me. We had to start out with that mob clinging to the car all around. We stopped again and pulled them off, and when we would start they would run ahead and jump on; people ran out of saloons and jumped on; you can't keep them off, unless you have your car built so as to keep them off the step. We can't prevent it.

Mr. Ely.—The answer to that proposition is, if you don't want to keep order and have the law observed, then there is only one other thing to do, and that is to go out of business.

Mr. Vreeland.—I was not referring so much as to whether the rule could or could not be enforced. I was asking whether a rule of that kind should be incorporated in the book of rules. Sometimes, in the course of the year, you break the rules. It is only within six weeks that we had a decision in New York City, and it was quoted by all the papers, where a passenger was injured on the step of one of our cars. There was no negligence on the part of the company; it was his own fault; he had no business there, and the rules of the company did not allow him to stand on the steps; and I, for one, do not want to adopt any such system of rules that is so permissive in its character that it can be used against us. I am not saying that anyone can or can not enforce the rule. We have no unruly element in New York City; it is the best governed city in the world. (Laughter.)

Mr. Wheatley.—I have listened with a great deal of interest to this discussion, and my conclusion is this: That while it may be very well as a general proposition to enunciate in these rules as a principle we want to carry out that passengers are not allowed to ride on the runningboards of cars, there are conditions and circumstances local to certain systems of railways where it would be impossible to enforce the rule. It is a question, from a legal standpoint, whether, after the conductor has notified the passenger that it is against the rules for him to ride on the runningboard, and an accident occurs therefrom, the company would be liable in case of accident. My impression would be that, after receiving that notice from the conductor, should an accident occur, the company would not be liable. It seems to me that the idea of the committee is correct when it attempts to enunciate only general principles in these rules, leaving each railway to add certain regulations to the rules to govern the local conditions in the territory of the service. In Brooklyn we have a large excursion business, and we find there are times when it is almost impossible for us to keep the people off the runningboards. It would take an army of policemen at different points along the line to keep them off, and, although we are in sympathy with the idea of making the passengers get inside, and we like to have the rule carried out, we find that we are utterly unable at certain times and on certain occasions to have the rule enforeed. We have, therefore, come to the conclusion that perhaps we will content ourselves with serving a notice on them that they are not permitted to ride there, and if they do so they ride there at their own risk.

Mr. Connette.—In order that the committee may have the advice and benefit of legal propositions, I move that the secretary, Mr. Robinson, be added to this committee, so that the committee may steer straight on all legal propositions that may attach to any of the roads.

Motion seconded and carried.

The President.—Is there any further discussion under this head? I think it is well to have this public discussion.

Mr. Allen.—Page 2, Rule 3, gives the conductor charge of the car. I would like to ask if any members of the association have ever put in force the rule giving the motormen charge of the car? I tried that on an interurban property, and I have found that the rule worked to great advantage. I would like to know the experience of the other members of the association in that respect.

Mr. Powers.—Our conductor has charge of the car so far as operation is concerned.

Mr. Nicholl.—We treat our conductors the same as conductors on steam roads are treated; he is in charge of the train; the motorman is in charge of the machinery.

Mr. Powers.—In running a regular despatch system the conductor is furnished with a copy of any special orders, and is held equally responsible with the motorman to see that they are enforced; that is merely to help the motorman's memory, but in all other respects the motorman has control of the car and operates it.

Mr. Cooper.—In regard to that, I always found it unwise to give the motorman charge of the car, because he is a fixture, just as an engineer is on the locomotive. The free man, the conductor, should be the man who should have charge of the car.

The President.—Mr. Powers has something to lay before the association.

Mr. Powers.—It is with great pleasure that I offer the place for the next convention, which is Caldwell, on Lake George. The railway which I represent runs now from Troy and Albany over the tracks of the United Traction Company, following the Hudson River to Lake George; and the railway has purchased and owns the property formerly known as the Fort William Henry Hotel, and the large park surrounding it. We also control the Saratoga property, and it is now a part of our railroad. It will be connected up before next year with the main line, and will enable you to see Saratoga, should you desire, and go sailing on the lake at that point. We have a casino there with a seating capacity sufficient to seat this assemblage, and we have plenty of room inside in case of inclement weather. I extend this invitation in the name of the Hudson Valley Railway Company, including transportation from Troy or Albany, as our cars will be in operation in Troy or Albany, or both, by the time the convention next meets, so you may take a trip directly from Albany, some 60 miles to the lake, and there receive the hospitalities of Mine Host Pike. Mr. Colvin, president of the company, and myself, both of us, extend our most cordial wishes to you that you will make that your next place of meeting. (Applause.)

Mr. Ely.—I move that the invitation be accepted.

Motion seconded and carried.

Mr. Ely.—I move that a vote of thanks be extended to Messrs. Colvin and Powers for their courtesy.

Motion seconded and carried.

The President.—Is there any further discussion on the rules?

Mr. Vreeland.—While we are picking the rules to pieees it might be proper for me to state that there is one rule here which, if enforced, would tie up a good many roads. Our road would be completely tied up by Rule 14 on page 4, the one in reference to one car passing another on curves.

Mr. Wheatley.—I do not know that I am called upon to appear here as a defender of this committee, but I think I can see the object of the committee in putting that rule into the book. I have known a great many eases where cars jump the track going around curves. Where the car on the inside of the track jumps a track, and at the same time a car is passing on the opposite rail, when you might have a serious collision. Certain railways have other local conditions that might make it necessary for them to have this rule. In certain cities where the streets are narrow the cars will not always clear one another in passing around curves, and it is necessary for them sometimes to have the rule that cars must not attempt to pass upon curves. It is another one of those things that might very well be left to each railway to make a rule to suit its local conditions, but as a general proposition it would be better if we had the rule not to pass on curves unless the traffie of the railways will permit.

Mr. Morgan.—It seems to me that the great majority of roads are in such a position that that rule would interfere. It seems to me it would be better if that portion of the rule were

stricken out, and that the portion of the rule desired can be added and marked 14-A. If any of you have been over my road you would see that it would be difficult for us to operate under that rule, as our line is made up of curves.

MR. NICHOLL.—We have a number of streets where we are obliged to have double tracks and double-track curves, and the streets are so narrow that we can not get the proper distance between the tracks, so we are compelled to have all cars stop before they go around the curve; that is, on some of the curves. Another reason is that we have sometimes to operate longer cars on one road than another with greater overhang, and they are liable to collide. I think it is a good thing to have that rule stricken out and leave it to the option of the local roads, and make it 14-A.

MR. REED.—Our tracks are 9 ft. ½ in. between centers on narrow streets; that is, 4 ft. 4 ins. between gage lines. On avenue lines our standard distance is 10 ft. ½ in. between centers, or 5 ft. 4 ins. between gage lines. On all curves we arrange to give ample clearance between cars, so that they can pass each other safely. The distance between tracks on curves varies according to local conditions and radius of curves. Where the distance is 4 ft. 4 ins. between tracks, it is generally necessary in entering curves to widen this distance to 4 ft. 6 ins. just before the true P. C. is reached. The distance between tracks on curves thus varies. It is often necessary, in order to get sufficient clearance for cars between curves, to increase the radius of curves, and in the city of New York the department of highways encourages the cutting of the corners of the curbs, so that we may have ample clearance in passing around the corners. Our minimum distance between the track and the curb is 3 ft. 6 ins. on the inside curve. We make no attempt to leave room for vehicles to pass between track and the curb. All curves are compounded. Our standard begins at 100-ft. radius and compounds to 40-ft. minimum radius where necessary. There are no places on any of our lines where cars can not pass safely, except in one or two places on Broadway, where the tracks were designed for the short cars. It would be impossible for our long double-truck cars to pass with the fenders down. We are arranging at present to increase the distance between tracks at these points. In New York City avenues are 100 ft. in width—that is, 60 ft. between curb lines—and the streets are 60 ft., or 30 ft. between curb lines. The width of Broadway varies, the regular distance between tracks on Broadway being 4 ft. 6 ins.

MR. VREELAND.—There is one point in connection with our road which probably would not be the same as other systems, that is that we must allow between our tracks room for a passenger or anybody else to stand. The Broadway policeman never leaves the center of the tracks. Two of our cars can pass on Broadway, and the average New York Broadway policeman is about as big around as they make them, and still there is room for them; it is the same on all our lines. We would have a great many accidents if we did not allow room so that people could stand in between the cars. That makes our situation different from that of anyone else. When we are running under ten-second headway, if persons could not get in between the cars once in awhile he would never get across the street. Our Broadway cars are 7 ft. wide. We are allowed only 4 ft. between the tracks.

I would like to suggest that as the special subject arranged with reference to employees has brought out more discussion than anything we have had before us this year, I believe that and the subject of dealing with accidents are the most important questions we have to consider in the operation of our roads, and the practice on this point of the various cities, large and small, is very valuable. I move that the president be empowered to appoint a special committee on accidents, to be subdivided as may be suggested during the year, and assigned by either Mr. Robinson or myself, or anyone that the president sees fit to appoint. It will be arranged the same as these topics yesterday; that is, a short presentation to open it up for a general discussion.

Motion seconded and carried.

MR. WHEATLEY.—I move that the same disposition be made of the subject of the economical use of power by the motormen. I think another committee ought to be appointed in the same manner to handle this subject, and report upon it, so that we can discuss it at the next meeting; I think it will be very beneficial to all of us.

Motion seconded and carried.

THE PRESIDENT.—There are three or four papers yet to be read, but our time is so limited that we can not listen to them now. I have spoken to the authors of these papers, and they have consented to have them printed.

MR. ELY.—I move that they be printed and spread upon the minutes of the meeting.

Motion seconded and carried.

MR. ELY.—I move that a vote of thanks be extended to all those who have prepared and presented papers to this convention.

Motion seconded and carried.

MR. VREELAND.—The supplies, in my opinion, are the best that we have ever had in connection with any convention of the Street Railway Association of the State of New York, and I move that a vote of thanks of the association be extended to the supply men for the interest they have taken, and the character of exhibits they have given us; and also that a vote of thanks of the association be extended to the Rochester Railway Company for the splendid entertainment they have given us. It certainly has been the best meeting of either the State or American Association in point of interest in convention proceedings that I have ever attended, and there is no question about both the liquid and solid entertainment we have had.

The motions were seconded and carried by a rising vote.

MR. NICHOLL.—On behalf of the Rochester Railway Company I thank you very much for your kind expression.

MR. WHEATLEY.—The nominating committee submits the following report: It nominates for the officers of the association G. Tracey Rogers for president; E. G. Connette, first vice-president; A. B. Colvin, of the Hudson Valley Railway Company, second vice-president; Henry A. Robinson, secretary and treasurer; for members of the executive committee, G. Tracy Rogers, H. H. Vreeland, T. J. Nicholl, W. Caryl Ely and J. L. Greatsinger.

MR. VREELAND.—I move that the report of the nominating committee be received, and that the secretary be instructed to cast one ballot for the election of the officers named.

Motion seconded and carried.

Secretary Robinson stated that he had cast the ballot as directed and the president declared the gentlemen named elected as the officers of the association for the coming year.

The convention then adjourned.

A Long Trolley Trip

At the invitation of J. S. Hamlin, master mechanic of the Union Traction Company, of Indiana, a party of street railway men took an extended trip of inspection over the lines of that company Sept. 4. The trip was made in the private car of the company, the "Martha," which is provided with every convenience, including sleeping berths. In all, a distance of 245 miles was covered. The party included the following: F. J. J. Sloat, of the Southern Ohio Traction Company; W. C. Kelly, of the Metropolitan Elevated Railway Company of Chicago; Charles Romelius, of the Indianapolis Street Railway Company; A. B. Hogue, of the Indianapolis, Greenwood & Franklin Railway Company; W. H. Gray, of the Peckham Manufacturing Company, and James Campbell.

The start was made from Indianapolis at 9 a. m., and a quiet run was made to Anderson and then to Muncie. The car then returned to Anderson, where a visit was made to the power station of the company. Hence the party traveled to Marion, stopping off at the Soldiers' Home in that city. They then returned to Anderson and then to Indianapolis, which was reached at 9:20 p. m.

Lunch was served on board the car, which carries a porter and a cook. The trip was highly enjoyed by all, and was voted by them an innovation which was highly popular.

Opening of Boyd Park on the Wabash

The Wabash River Traction Company, which completed its line from Wabash to Peru, Ind., this summer, last month opened up Boyd Park on the banks of the Wabash River, near Rich Valley. The business men of Peru and Wabash were the guests of honor. The location is said to be an ideal one for a pleasure resort of this kind. A $4,000 casino is being erected and a stage has already been put up, where performances are given each afternoon and evening. The power house and car house of the company are also located at this point. At the time of the opening a special car took guests from Peru and Wabash, and a lunch was served by the company at the park, followed by speeches from prominent guests. Boyd Park is named after the vice-president, F. C. Boyd, of the Wabash River Traction Company, who is also well known to street railway men through his connection with the New Haven Car Register Company. The general offices of the company are at New Haven, Conn. D. A. Blakelee is president; F. C. Boyd, vice-president; S. C. Moorhouse, secretary and treasurer, and L. T. Law, general manager.

The Application of Storage Batteries to the System of the Brooklyn Heights Railroad Company*

BY FRANKLIN E. MORSE
Superintendent of Power, Brooklyn Heights Railroad Company

The storage battery equipment of the Brooklyn Heights Railroad Company consists of three chloride accumulator batteries of 248 cells each, installed by the Electric Storage Battery Company.

Battery No. 1 is located at the Brooklyn terminal of the New York and Brooklyn Bridge. Each of the cells contains fifty-one plates, approximately 15½ ins. square, and has a discharge capacity of 2000 amps. for one hour, 1500 amps. for two hours, or 500 amps. for three hours.

Battery No. 2 is a portable battery mounted on cars, the cells containing twenty-seven plates, 15½ ins. square, with a discharge capacity of 1000 amps. for one hour, 750 amps. for two hours, or 500 amps. for three hours.

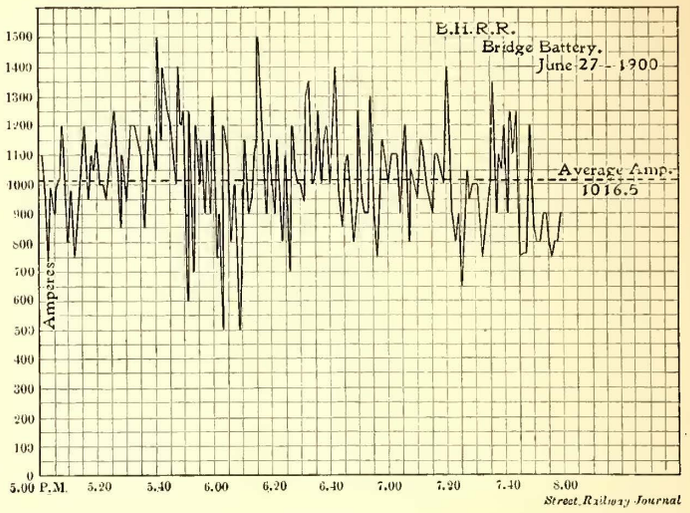
Battery No. 3 is a stationary battery of the same capacity as No. 2, located at East New York, at a load center formed by the junction of several elevated and surface lines.

The batteries were intended mainly for regulator work, to take up the excessive fluctuations in voltage and amperes upon lines over which electric trains were operated, and for some time they were thus used with excellent results; but for the last nine months or more, on account of a shortage of power caused partly by the destruction of one of the company's power stations by fire, it has become necessary to use them for peak work, completely discharging them during the morning and evening rush hours, and charging them during the hours of lighter travel. Used in this manner, the combined capacity of the three batteries is 4000 amps. for one hour, 3000 amps. for two hours, or 2000 amps. for one hour. As a general rule they have been discharged at the two-hour rate, and they have proved to be a valuable addition to the station capacity.

Battery No. 1 occupies two of the arches which support the masonry forming the Brooklyn approach of the Bridge; these arches are quite high and roomy, and only required to have the ends enclosed to make ideal battery rooms—warm in winter and cool in summer. With the exception of a few cells supported by a gallery, the entire battery rests on wooden stringers imbedded in a cinder floor. Operated in connection with the battery, there is a motor-driven booster used for regulating the charge and discharge, and located together with the switchboard in a small building on the Bridge deck about 1000 ft. from the battery.

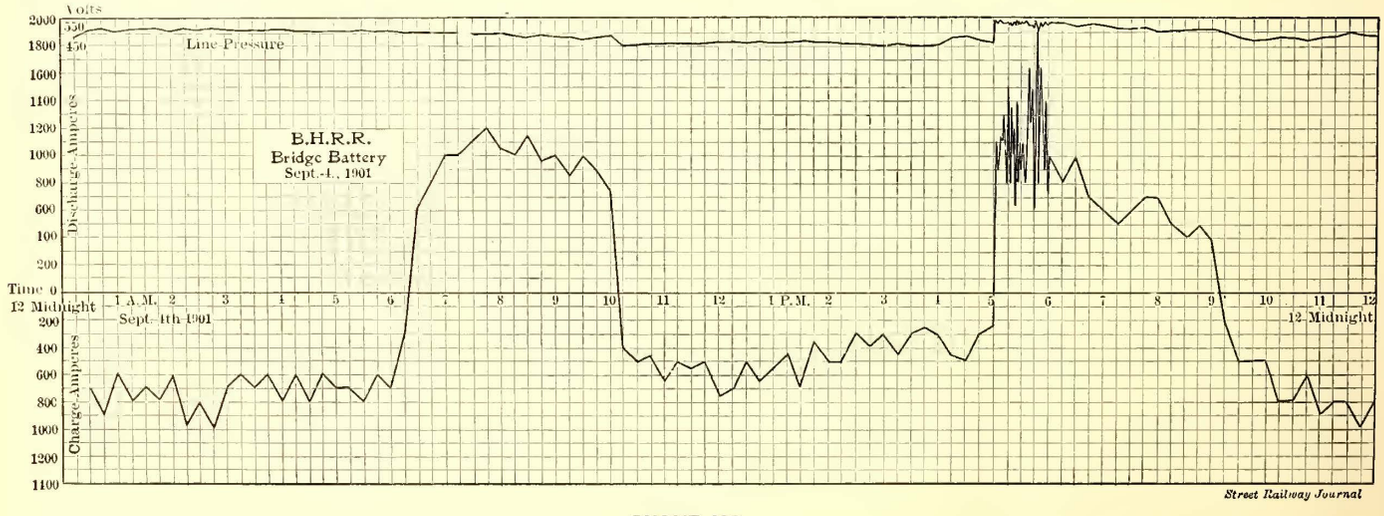
This battery was installed for two purposes; (1) to allow the small power plant which supplied current for the Bridge trains to be dispensed with, and (2) to take the fluctuations of current on the adjacent lower section of the Brooklyn Elevated Railway, and maintain the even voltage necessary for the satisfactory operation of both the elevated and Bridge trains. The lower section of the elevated was previously fed from the eastern power station at a distance of about 3 miles from the load center. After the installation of the battery, both the Bridge and elevated train service, requiring approximately equal amounts of current, were fed from the eastern station through the same feed wires, which had before been hardly sufficient for the operation of the elevated service alone.

The power plant which formerly supplied current for the Bridge trains had a capacity of but 1000 kw, and on account of its small capacity and its being some distance from the water front, where there was no water available for condensing, and where coal and ashes had to be hauled in wagons, it was very expensive in operation. Upon the installation of the battery, the saving effected, after allowing for depreciation, maintenance, operation and the cost of current at the eastern station, amounted to a very profitable interest on the investment.



CURVE NO. 1

The Bridge train load during the rush hours in the morning and evening fluctuated between a minimum of 250 amps. and a maximum of 1800 amps., with an average of 850 amps. The load on the lower section of the Brooklyn Elevated, when fed from the eastern station, fluctuated between 100 amps. and 2000 amps., with an average of 750 amps., and during the higher fluctuations the voltage dropped so much that it seriously interfered with the operation of the trains. After the installation of the battery, the combined load of the Bridge and elevated trains amounted to an average of but 1600 amps., which was divided up between the battery and the eastern station, the battery carrying a load which fluctuated between 500 amps. and 3000 amps., averaging 1100 amps., and the eastern station a fairly constant load of 500 amps. in place of its former fluctuating load of from 100 amps. to 2000 amps. A steady voltage was maintained on both the Bridge and elevated, and no further trouble experienced in operating the trains.



CURVE NO. 2

Curve No. 1 shows an evening's work on this battery when operated as above, the average load on the battery being 1016 amps.—the maximum 1450 amps. and the minimum 500 amps. The curve shows that between 5 p. m. and 8 p. m. the battery, besides regulating the fluctuations, discharged an average of 1016 amps., somewhat more than its rated capacity.

On account of the shortage of power, caused partly by the burning of the Ridgewood power house in December, 1900, it became necessary to operate the Bridge power station again

* Paper read at Rochester Convention of New York State Street Railway Association, Sept. 10-11, 1901.

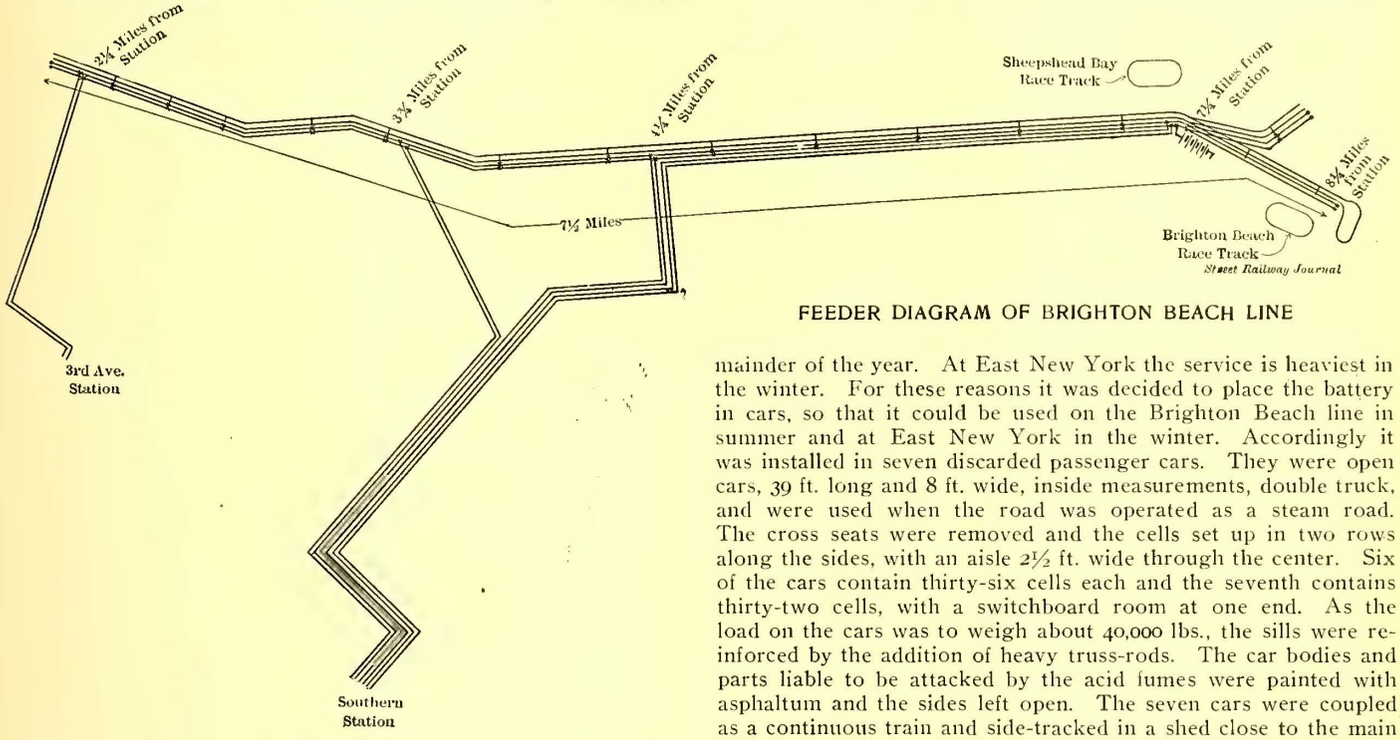
during the morning and evening peaks. It is a rather interesting fact that, by operating in multiple with the battery, the effective capacity of the station is nearly doubled; for by properly adjusting the proportion of current flowing through the series coils of the generators, the station is enabled to get a steady load of 1600 amps., the maximum at which the engines will maintain their speed, instead of its former fluctuating load of from 250 amps. to 1800 amps., which gave an average of only 850 amps.

Diagram No. 2 shows the work done by the battery for twenty-four hours. The curve is plotted from average reading taken every fifteen minutes, except between the hours of 5 p. m. and 6 p. m., when the readings were taken every minute and a half. You will note that the battery is being charged from 9 o'clock at night until 6 o'clock in the morning, and discharged to its full capacity from 6 o'clock until 10 o'clock in the morning; then charged from 10 o'clock in the morning and 5 o'clock in the afternoon and discharged to its full capacity between 5 o'clock and 9 o'clock in the evening. This is a curve of average, and does not show the momentary fluctuation. These are shown on curve No. 3, which is a record of one hour during the evening peak, the readings being taken as rapidly as it was possible to read the meters. This curve shows a variation of 1300 amps. at one jump.

The above curves show quite conclusively that if the battery were not operated it would have to be replaced by a generator at the Bridge station, having a capacity of at least 1200 amps., together with engines and boiler equipment; or, if installed at the eastern station, there would be a considerable additional expense incurred for feed wire.

The booster used with the battery has a capacity of 120 kw, and has a large range in both voltage and amperage. It is operated almost continuously day and night, and the booster has a shunt-field rheostat, by means of which the polarity may be reversed without cutting the machine out, and the voltage may be varied from zero to a maximum in either direction. The heaviest charging is done when the load on the generating station is lightest, the aim being to keep the voltage on the line at as high an average as possible, and at the same time get the battery fully charged ready for the rush hours. If, during the period allowed for charging, the line voltage drops on account of a momentary heavy load, the booster allows the battery to discharge; and if there is a brief let-up in the load during rush hours, it allows the battery to charge. Thus, it is practically automatic in its operation. No attendance is required for the battery itself, except hydrometer readings at beginning and ending of charge and discharge. In order to reduce the line loss connection has been made with all the feed wires available, and they are drawn upon during the charge.

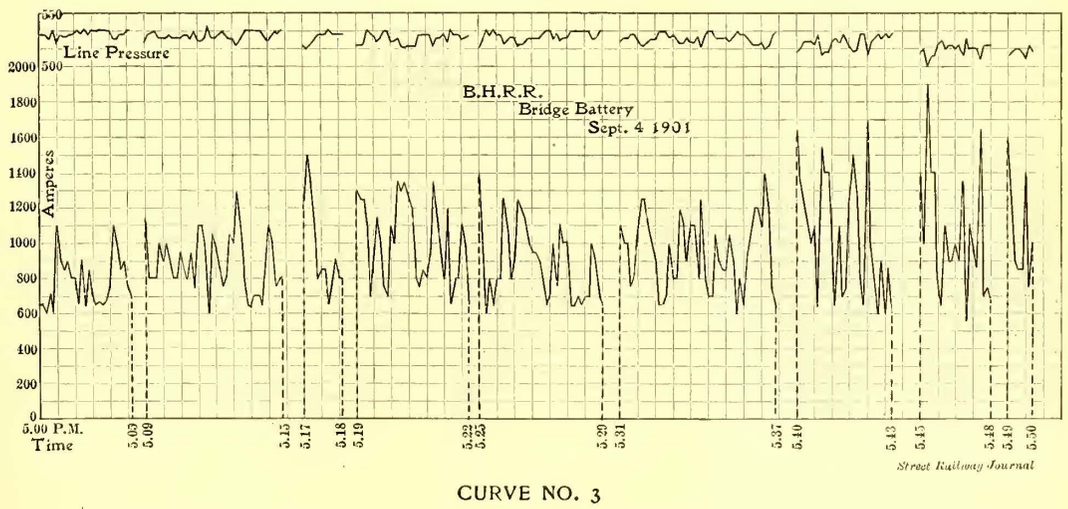
The portable battery, No. 2, is rather unique in its character, and was designed to meet peculiar conditions. The Brighton Beach road is a line over which the traffic is very heavy for about three months during the summer and very light during the remainder of the year. At East New York the service is heaviest in the winter. For these reasons it was decided to place the battery in cars, so that it could be used on the Brighton Beach line in summer and at East New York in the winter. Accordingly it was installed in seven discarded passenger cars. They were open cars, 39 ft. long and 8 ft. wide, inside measurements, double truck, and were used when the road was operated as a steam road. The cross seats were removed and the cells set up in two rows along the sides, with an aisle 2½ ft. wide through the center. Six of the cars contain thirty-six cells each and the seventh contains thirty-two cells, with a switchboard room at one end. As the load on the cars was to weigh about 40,000 lbs., the sills were reinforced by the addition of heavy truss-rods. The car bodies and parts liable to be attacked by the acid fumes were painted with asphaltum and the sides left open. The seven cars were coupled as a continuous train and side-tracked in a shed close to the main line. The end cells in each car were connected by rubber-covered wire, the negative connected to the tracks and the positive to the side feed wires.



FEEDER DIAGRAM OF BRIGHTON BEACH LINE

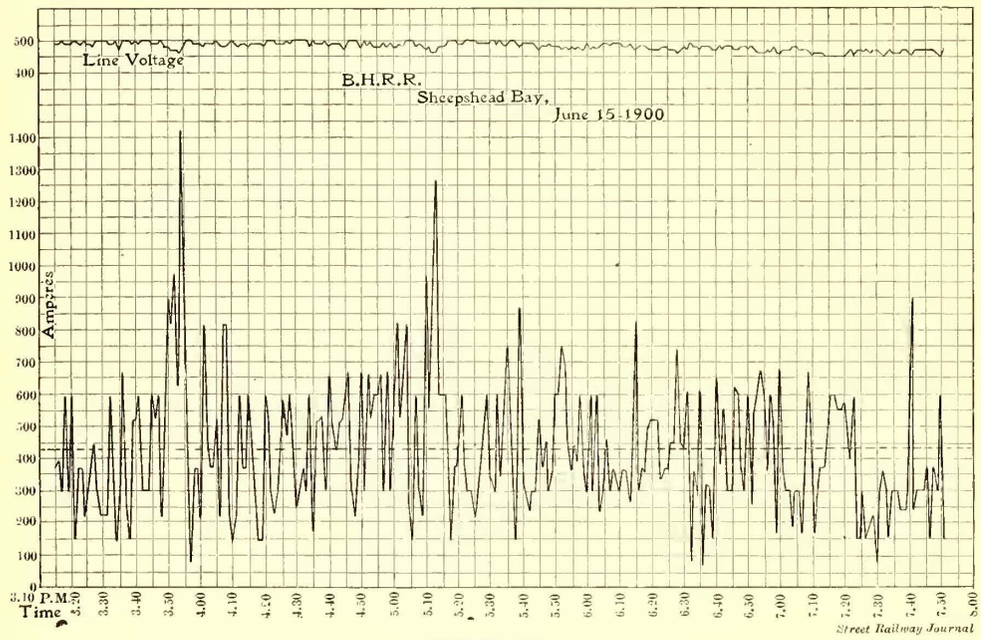
The Brighton Beach Railway is an overhead trolley line, double track, 7½ miles in length, over which, in summer, trolley cars are run at a high speed on 1 1-3-minute headway, and five-car electric trains on 20-minute headway. It carries passengers to and from the Brighton Beach and Sheepshead Bay race tracks and to the Brighton Beach and Manhattan Beach hotels. The nearest point of feed is 2 miles from the power station, and the most distant point 8½ miles. For the proper operation of the trains it was essential that the voltage should not drop below 450 amps. on any part of the line. To prevent local drops in the trolley wires, they were supplemented by two 500,000 circ. mil cables, run the entire length of the road and joined together at frequent intervals.

The current was brought from the stations over eight 500,000 circ. mil cables, tapped into the supplementary wires in pairs, at points very nearly equidistant. The two nearest points of feed—2¼ miles and 3¾ miles from the station—were fed from the station bus. The more distant points—4¼ miles and 7¼ miles—were supplied through boosters in the power station, one boost-



CURVE NO. 3

ing 150 volts and the other from 350 volts to 450 volts. The storage battery was connected at the point where the last booster fed into the line, about 1 mile from the terminal. The service at this terminal is of the most exacting nature, trolley cars and trains being sidetracked to await the crowds at the race tracks and started up, fully loaded, at short intervals. Notwithstanding the heavy character of the service, by means of the battery the voltage was maintained at a very even pressure.



CURVE NO. 4

During the day the battery fluctuated between 1500-amp. discharge and 500-amp. charge, being kept practically full most of the time. At the periods of heaviest load, however, a complete discharge was sometimes effected in one hour.

Curve 4 shows graphically the regulation of this battery on July 21, 1900, between the hours of 6:45 a. m. and 11:25 p. m. During this time variations of from 1000 amps. to 1800 amps. on the line in the vicinity of the battery produced no greater fluctuations than 200 amps. on the booster at the southern station.

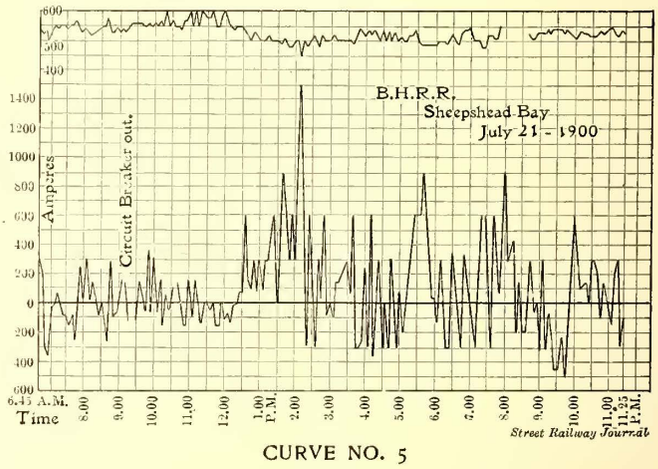
Curve No. 5 represents a discharge taken June 15, 1900, at an average rate of 430 amps. for four hours and thirty-five minutes, a considerable excess over the rated capacity of the battery. During this discharge the current fluctuated between 100 amps. and 1300 amps., and the voltage averaged 474 amps.

If the battery had not been used in connection with this line, and the same service maintained, it would have required the addition of another booster at the southern station, having a capacity of 1000 amps. and 160 volts, together with additional generator engine and boiler capacity. Besides this, there would have been the expense of running additional feed wire.

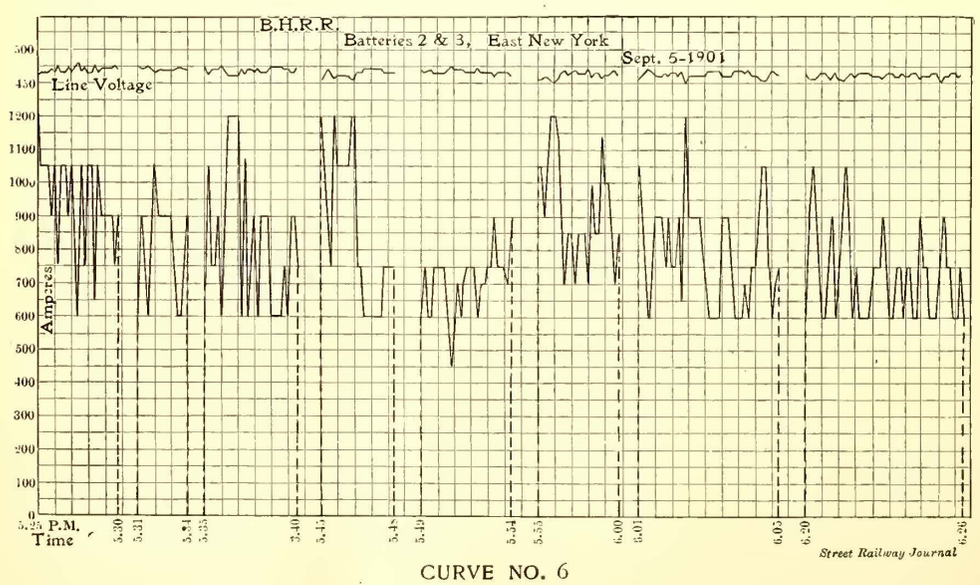
At the end of the season the cars were hauled to East New York, and have remained there up to the present time, the Brighton Beach electric train service having been abandoned this summer on account of the shortage of power, and a steam-train service substituted. At East New York it is operated in multiple with battery No. 3, which has the same capacity. It has been left standing on a side track out of doors, the sides of the cars having been enclosed with heavy tar paper. It was anticipated that the acid might freeze up during severe winter weather, and each car was supplied with electric heaters, but it was not found necessary to use them.

For a time these two batteries were charged from the Ridgewood station, a distance of 2 miles, one of the 300-kw generators being converted into a booster, during the hours of light load, by means of special transfer switches. After the burning of the Ridgewood station they were charged for a time from the eastern station, a distance of 4 miles. In order to do this with the amount of feed wire available, it was necessary to split each battery in halves while charging, thus converting two batteries of 248 cells each into four batteries of 124 cells each. This was undoubtedly a wasteful method, but it answered as a makeshift.

They were afterward charged from the Third Avenue station, using a generator converted in a booster, and are now charged from the Halsey sub-station, a distance of 1 mile, by means of a motor-driven booster.



CURVE NO. 5



CURVE NO. 6

Curve No. 6 shows the rapid discharge readings taken on these batteries between 5:30 p. m. and 6:30 p. m.

As stated before, they are now used altogether for peak work. If not used they would need to be replaced by the addition of 1000 amps. in rotary capacity at the Halsey Street sub-station, and 1 mile of 1,000,000 circ. mil feed wire.

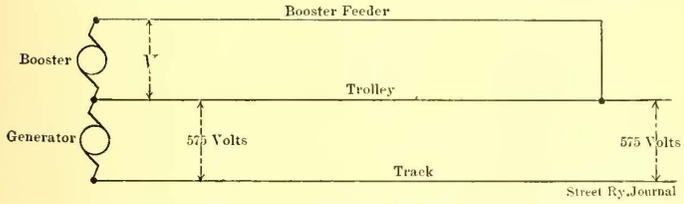
In conclusion it may be stated that, aside from its operation, as above outlined, the battery equipment has been of great service during emergencies, having been cut in at various times on short notice on account of accidents to power station machinery. Storage batteries adapt themselves very readily to this kind of service, as they can be occasionally discharged at an excessive rate and exhausted beyond their capacity without apparent injury.

Combined output of storage batteries for two hours = 3000 amps. at 575 volts = 1267 hp; cost about $75 per horse-power; 20,000 hp at Third Avenue cost $60 per hp; 24,000 hp at Fulton Ferry, $75 per hp; acid, one year, 1500 gals., $200 = one-eighth of 1 per cent of cost.

The Use of Series Boosters in Connection with Street Railways*

BY W. J. DAVIS, JR.

One of the problems frequently arising in street railway work is the proper maintenance of voltage on certain lines operating normally with a small number of cars, but occasionally calling for increase in service greatly exceeding the average requirements. Common illustrations of this class of service are to be found on lines running to race tracks, parks, or other pleasure resorts within reasonable distance from the center of population. The infrequency of the service during the greater part of the year will not permit heavy expenditure for an overhead feeder system of sufficient capacity to operate the cars satisfactorily during times of abnormal service. Obviously, when the cars are crowded with passengers, the cost of power is so small an item, compared to the gross receipts, that little attention need be paid to securing high economy in power consumption, especially where the demand is only for a few days in the year; and it is in this class of work that the very effective, although inefficient, return feeder series booster finds its especial field. The usual connections for this highly useful piece of apparatus are shown in the accompanying diagram.



From this diagram it will be seen that the ampere-load carried by the booster will be between one-half and two-thirds of the total load on the line, according to the location of the point at which the booster feeder is tapped into the trolley circuit. On account of economical considerations, it is the practice, where possible, to arrange the booster feeder connections in such manner that when the booster is not in service the feeder may be thrown directly on to the generator bus-bars for effective use as an ordinary trolley feeder. In order that the potential at the point where the booster feeder is tapped into the line may be exactly equal to the potential of the generator in the power house, the booster and booster feeder should be so designed, relative to each other, that at full load the voltage generated in the booster will equal the drop in the booster feeder plus the drop in the track return. For reasons hereinafter stated, it is advisable, where high-voltage boosters are used, to partially or entirely neglect the track drop, so that in practice the voltage at the terminal of the booster feeder will be somewhat less than at the generating station.

The IR drop in the booster feeder is, of course, directly proportional to the current flowing therein, and, theoretically, the voltage at the terminals of the series booster should also be directly proportional to the current. In other words, the booster should have a straight line characteristic curve; but, owing to the variable permeability of the iron at different densities, it is impossible to build a booster meeting these conditions. A straight line characteristic may be approximated, however, closely enough for practical purposes by providing liberal sections in the magnet frame of the booster, and thus working well below the knee of the saturation curve for the iron. While such a design adds to the cost of the machine, the advantage of close regulation, as affecting the life of the car lamps and causing possible injury to motors and controllers, due to the high voltage to which they may be subjected when the ampere-load is reduced, makes the additional cost an insignificant item. Experience has determined that the maximum departure of the booster characteristic from a straight line at fractional loads, referred to full-load voltage as a basis, should not exceed the following values:

Full-Load Voltage of Booster	Maximum Variation in Characteristic Curve
50 to 100 volts	20%
100 to 150 "	15%
150 to 250 "	12½%
250 to 500 "	10%

To illustrate: a 300-volt booster, according to the above table, should have a characteristic departing not more than 30 volts from a straight line, so that, at partial load, the maximum potential upon the line would not exceed 605 volts, with 575 volts at the generator bus-bars. There is a practical limit to the amount of this variation, which is fixed by economical requirements in the electrical design of the booster. This limit is about 10 per cent, and consequently, where the boosting potential exceeds 300 volts, the resistance of the feeder should be made such that the IR drop is 5 per cent, or possibly 10 per cent greater than the booster voltage. This provision will result in preventing injuriously high voltage at the lamps and motor at the expense of a small reduction in line potential, which is not of sufficient magnitude to seriously affect the schedule speed of the cars.

Having now given the principal requirements of a series booster from the standpoint of the designing engineer, it may be of interest to define the exact field of the machine in practical operation and the limitations of its economical use.

As stated above, the series booster becomes especially valuable in maintaining the line voltage where large crowds are to be transported quickly and effectively on very infrequent occasions over lines which normally may be operated with a reasonable amount of feeder copper, and where a good rail return is secured. The maximum length of line which may be fed with economy is entirely dependent upon the power to be transmitted and to the resistance of the track. Generally speaking, with modern equipments employing heavy double-truck cars, it is not practicable to feed further than 12 miles, while in some cases requiring the operation of a very large number of cars on short headway the maximum practicable length of feed may not exceed 6 miles or 7 miles.

Economically considered, the booster simply affords a means of saving line copper by drawing on the coal pile, and it ceases to be economical when the cost of power lost exceeds the interest on the additional copper required by a direct feed. Every case involving the permanent installation of a booster requires thorough study, and consideration should be given not only to the question of economy, but to probable future increase in the traffic and to extensions of the line. The chief objections to the booster as a permanent fixture are the inability of the machine to respond to demands greatly exceeding the requirements for which it may have been designed and the limitations to the area to be covered. In many cases full investigation of all the elements entering into the problem will show the alternating-current system employing a rotary converter sub-station to be preferable to a booster, especially where the service is to continue for several months in the year. There are even occasions when such service as that existing at race tracks, usually lasting only ten or fifteen days, may best be handled by a portable sub-station consisting of a rotary converter and static transformers mounted on a flat car and operated from a high-potential, three-phase transmission line.

For quick or temporary service, or where three-phase alternating current is not available, the series booster is a most valuable auxiliary. Frequently a single machine may be temporarily adapted for use on either of a number of lines where the conditions differ considerably, by varying the resistance of the booster feeder, shunting the series field, or varying the speed. This makes the booster a great help where demands are made requiring large increase in service on certain lines which may last only a few days at a time, and it is in this particular class of work that the series booster will be found to possess the greatest value to the street railway manager.

* Paper read at Rochester Convention of New York State Street Railway Association, Sept. 10-11, 1901.

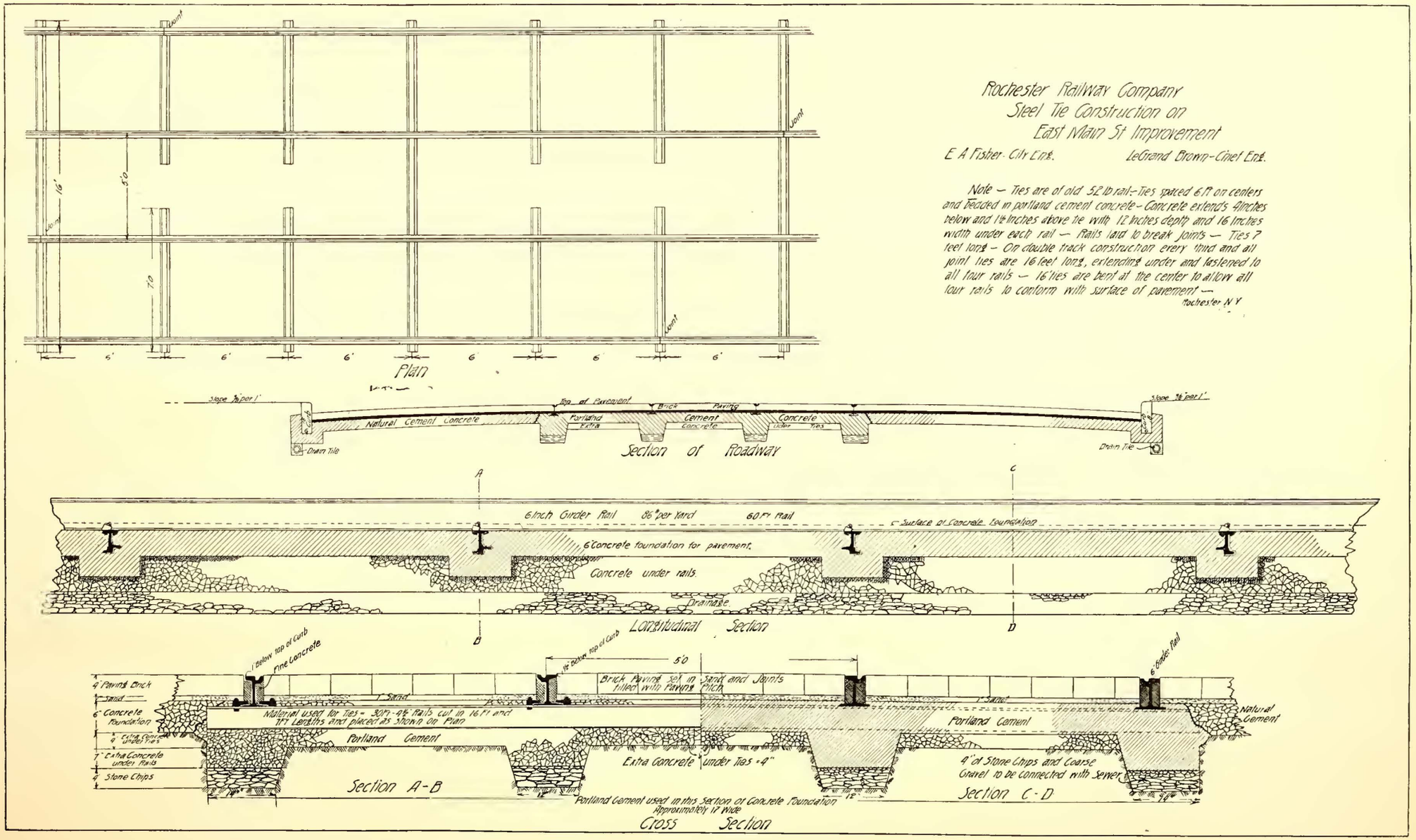
Steel Tie, Concrete Construction*

BY LE GRAND BROWN
Chief Engineer Rochester Railway Company

During the last four years the city of Rochester has made extensive improvements in the pavements of several of the principal streets occupied by the tracks of the Rochester Railway Company, and, in co-operation with the city engineer, E. A. Fisher, the railway company has endeavored to construct as perfect a roadbed as it was possible to make. In addition to the ordinary method of putting concrete under or between the wooden ties, considerable concrete-beam and steel-tie construction has been laid, and I will briefly describe the method adopted and cost of the same. In all new construction great care has been taken to provide as perfect drainage for the track as possible by the use of gravel and porous tile connected with the sewers. This matter of drainage is one of the most important, as well as often the most neglected, point in track maintenance, for the best gravel or stone ballast and heavy rail availeth little without proper drainage.

For ties we have used old 4½-in. girder rails cut into 7½-ft. lengths, inverting the rails and fastening them with bolts and clips to the main rail, as shown in Fig. 1 and Fig. 2, these steel

* Paper read at Rochester Convention of New York State Street Railway Association, Sept. 10-11, 1901.



FIGS. 1 AND 2.—PLAN LONGITUDINAL AND CROSS SECTIONS OF TRACK CONSTRUCTION USED BY THE ROCHESTER RAILWAY

ties being bedded in concrete. Underneath the rails are concrete beams 12 ins. in depth and 14 ins. in width. Where the ties are located, a trench is excavated 4½ ins. below the tie and about 12 ins. in width, and is filled with concrete, the remainder of the pavement being on a 6-in. concrete base. Under the whole is a 4-in. layer of stone chips. Drain tile is laid parallel with the track and connected with the sewers. The paving is laid upon a cushion of sand 1 in. in depth. In brick or asphalt paving the concrete is carried slightly above the base of the rail. Since 1897, when this construction was first tried, we have laid considerable similar construction with 6-in., 7-in. and 9-in. rail, in asphalt, brick and Medina stone pavements.

On tangent the steel ties are laid 10 ft., on curves from 3 ft. to 5 ft. apart. Where double track was laid on East Main Street, over a newly constructed sewer, every third, and all joint, ties extended under both tracks, as shown in Fig. 3. These have a slight vertical bend in them to conform to the crown of the street. A few channel-steel ties were tried but found unsatisfactory, it being difficult to tamp concrete properly under them without raising the track, while, with the old rail or any form of I-beam tie of proper depth, the concrete anchors the track down, thus preventing heaving, which will eventually occur with any form of channel tie or simple tie-rod or angle-bar construction without ties.

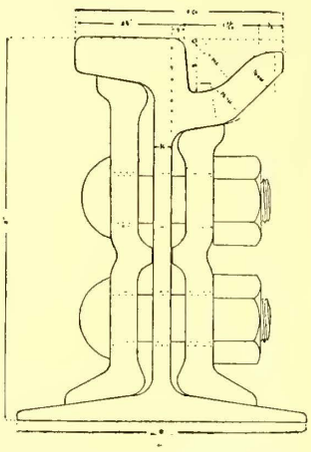


FIG. 4.—PROPOSED 8-IN. RAIL FOR THE ROCHESTER RAILWAY COMPANY, WEIGHT ABOUT 86 LBS. PER YD.

The track is raised and blocked to grade, and lined before concreting, and little trouble has been experienced in keeping it in place during the concreting. Care is taken to have the concrete well tamped under the base of the rail and around the ties, a rail having a 6-in. base being preferred. At present, on St. Paul Street, we are laying a 7-in. rail with steel tie concrete construction.

The cost at present prices of steel tie construction with 7-in. 90-lb. rail would be about between $4 and $4.10 per foot of double track. This includes excavation, concrete, drainage tile, labor and material, but no pavement. The steel ties are worth what they would bring for old steel, and, as they weigh about 116 lbs. each, they would cost from 71 cents to 75 cents; cutting and drilling, 12 cents to 13 cents; bolts and clips, about 15 cents; thus making the cost average about $1 each; the excavation, drainage tile and concreting costing from $1.25 to $1.35 per foot of double track. In 1898 these ties cost about 60 cents each, owing to the low price of old steel.

We have considerable track paved with asphalt, and find it impossible to keep the asphalt joining the rail in proper condition, even with a very heavy rail, except where a toothing course of stone is laid between the rail and asphalt, in which case it wears much better. We have also had some trouble with the pavement cutting down next to the tram of the rail and settling under the rail head. For this and other reasons a section has been suggested something like the section shown in Fig. 4. In this section the edge of the tram or flange allows considerable wear of the pavement without danger of the wagon wheels cutting down between pavement and rail. In this section the tram is slightly lower than the regular form of Trilby rail, allowing the groove to clean more readily. With this section it is proposed to have the plates rolled with less projection on the center ribs, thus allowing the plates to be brought to a tighter fit on top and bottom, as we find in many cases the rib comes up against the web of the rail before a proper bearing is obtained at top and bottom of plate. From our experience, I think it economy to use steel-tie construction, with 6-in. rail in brick or asphalt, and 8-in. in Medina stone pavements, a lower rail being used than would be required with wooden ties, and I believe the time not far distant when the wooden tie in paved streets will be a thing of the past.

Track Construction in Brooklyn

BY EDW. H. PACKE
Engineer Maintenance of Way, Brooklyn Heights Railroad Company

The traffic conditions in Brooklyn are unlike those obtaining in any other city, at least in America. We have suburban lines running for long distances at a high rate of speed; these converge, and the same cars and equipment run through outlying streets where a high speed can still be maintained until on lower Fulton Street. Here, during rush hours, both morning and night, the cars form almost one continuous train, and can barely crawl along. The number of cars on the New York and Brooklyn Bridge roadways is still greater, and without exaggeration it can be said that on these roadways the maximum of service is reached which any street railway track is called upon to carry.

When it was definitely decided to operate cars over these roadways, it was known that the service would be exceptionally severe, and the subject of rail section was thoroughly investigated by J. C. Brackenridge, at that time chief engineer of the track department of the Brooklyn Heights Railroad, and chief engineer of the associated trolley companies. He found that in the sections of 9-in. girder rail then in use the head of the rail was too far off center, and not properly supported by the web. In fact, from the gage line to the center of the web was only 3-32 of an inch. On taking this matter up with the steel companies, and sending them a sketch of the section designed by Mr. Brackenridge, the steel companies claimed they could not roll such a section. Mr. Brackenridge made a trip to Steelton, saw the rollmaker, and the latter said of course the rolls could be made. A 5000-ton order was placed with them, the rolls were made, and the first 9-in. girder rails, in which the head was

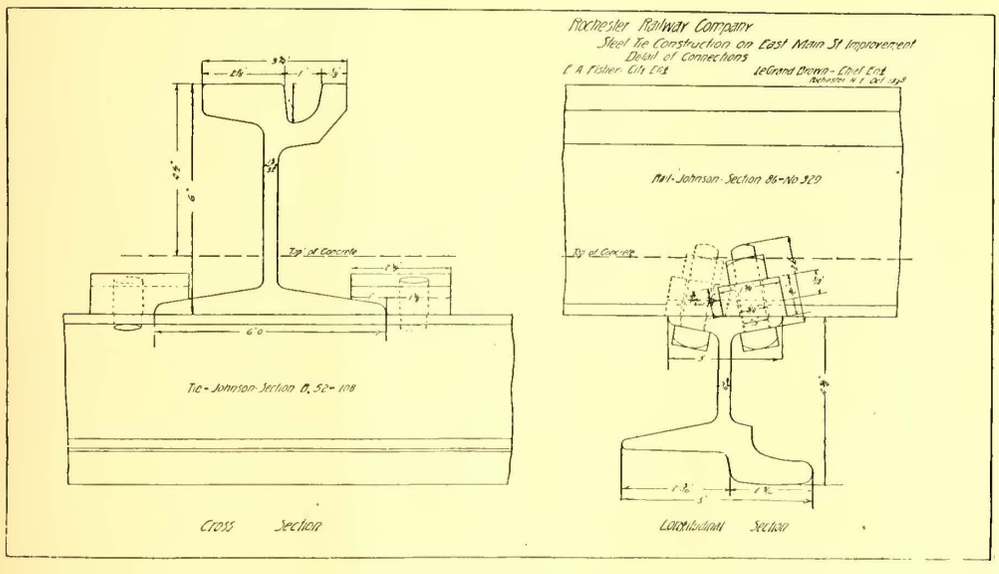


FIG. 3.—STEEL TIE CONSTRUCTION ON EAST MAIN STREET

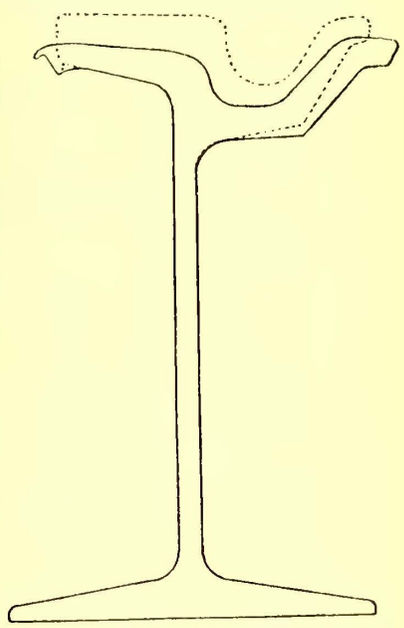


FIG. 1.—SECTION OF ORIGINAL RAIL AND WORN RAIL AFTER PASSAGE OF FIVE MILLION CARS

properly supported by the web, was laid on the roadways of the New York and Brooklyn Bridge in December, 1897.

How well this section was designed, and how closely the actual wear has followed the lines theoretically designed, is shown in the accompanying drawing, Fig. 1, which shows the original section of the rail and the section after 5,000,000 cars have passed over it in three and one-half years from the date of opening, Jan. 23, 1898, to Aug. 1, 1901.

Another feature of this groove rail is that it is self-cleaning, so to speak. Mr. Brackenridge had written to various railroad companies, requesting their experienee and an expression of their opinion as to the merits of groove rails then in use; all informed him that the rails of such sections were uneeonomical, as the grooves filled with dirt to such an extent as to cause the wheels to run on

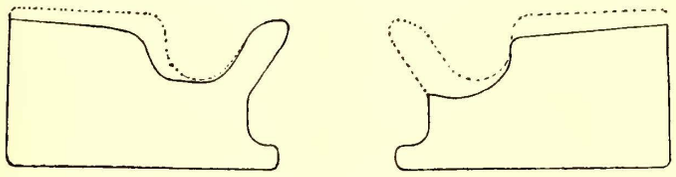


FIG. 2.—BRIDGE RAIL AFTER PASSAGE OF FIVE MILLION CARS

their flanges, thus making poor contacts, and costing 20 per cent more to operate. On account of the almost perpendicular gage-side of the treads and small fillets at the flat bottoms of the grooves, this objeetion could not be remedied.

In his design for a groove rail, Mr. Brackenridge overcame this difficulty by making the gage-side of the head more oblique, and the bottom of the groove the arc of a circle, whose radius is 9-16 in., more than twice that of the fillet in previous sections. By giving this shape to the head, the flanges of the wheels plow into any dirt which collects in the groove, and crowd it out over the lip of the rail, thus keeping it free and clean, and preserving the good electrical contact which is desired.

This rail, in 60-ft. lengths, is laid on the bridge approaches on a 6-in. bed of concrete, with tie-rods every 3 ft., and paved between rails, and outside as well, with granite block paving on the concrete bed, with pitch and gravel joints.

On the suspended structure, another specially designed rail section was laid, on stringers of creosoted yellow pine, and bolted down with 7-in. x ¾ in. bolts, with head countersunk in flangeway of rail, and a 2½-in. x 3½-in. x ½-in. washer, and spiral-split nutlock. The wear on this section of rail is shown on the accompanying drawing, Fig. 2. This has had the same number of cars pass over it that the 9-in. section, No. 241, had, *i. e.*, 5,000,000

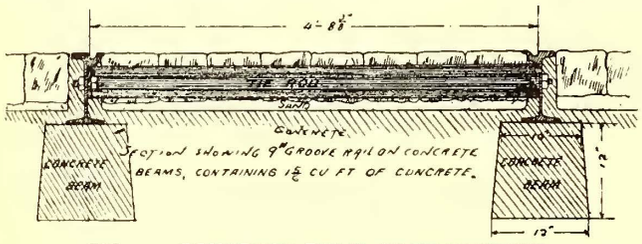


FIG. 3.—CONCRETE BEAM CONSTRUCTION

cars in three and a half years. Although the specifications for the steel were the same in both cases, the much greater wear on the rail on the concrete foundation is notable, amounting to about double the amount of metal.

The standard construction of the Brooklyn Heights Railroad Company in streets where the pavement is granite block on concrete foundation is as follows:

The street is excavated to the sub-grade, which is leveled off with sand. On this are laid the ties, 6 ins. x 8 ins. x 7 ft., with tamped foundations. On these are spiked the 9-in. girder rails, 60 ft. long, section as shown in Fig. 1, with brace tie-plates every third tie, as shown, Weber joints being used for splicing. After the rails are spiked down, and surfaced and lined, Portland cement concrete is rammed in between the ties, and around the ends of ties, forming a solid bed of 6 ins. above the sub-grade between the tracks and rails, and 2 ft. outside. On this is laid an inch of sand, in which to bed the paving. Hemlock rail filler is placed between the flange and head, and flange and tram of the rail, and granite blocks are paved in. The joints are then filled in with heated gravel and hot paving pitch is poured in the joints to fill up the voids.

On the heaviest linc, Fulton Street, bclow Flatbush Avenue, tie-rods, spaced every 5 ft., are uscd in addition to the brace tie-plates.

In the summer of 1899, in relaying the double-track line on Court Street, it was decided to lay one track (the northbound on a concrete beam construction, shown in Fig. 3, and the other, or southbound, track on regular tie construction without tie-rods, from Joralemon Street to Atlantic Avenue.

The old paving was removed, old track and ties torn up and the trenches for concrete beam excavated, and the beams laid by means of molding boards for the sides of the beams, accurately leveled on the upper edge to the proper grades for the base of the real, the sides being taken off and moved ahead as each section of beam set. The rails were laid on this in 60-ft. lengths, with Weber joints, whose sole plates were sunk flush with top of beam; tie-rods were spaced 3 ft. apart.

The cost of the concrete beam track was nearly double that of the track on tie work, though some of this extra cost was undoubtedly due to the unfamiliarity of the men with this style of work, and also to unavoidable delays. However, the extra cost does not seem to be justified, in view of the increased wear of the rails on the unyielding eoncrete foundation, as exemplified on the bridge approach and the suspended structure, although after two years the line and surface are still perfect.

On streets where the city has not yet adopted granite block paving no concrete foundation is used, and the pavement is laid on sand, well tamped, and with sand joints. The sand used is dug by our own men from a sand bank on our own property, loaded in our flat cars and hauled direct from the bank to the point required. Material is also handled on flat cars wherever possible.

On the Coney Island lines, on our private rights of way, in several cases, electric and steam trains are operated simultaneously with trolley cars. This renders the conditions regarding traek work peculiarly exacting, as T-rail construction is used, whieh must pass steam wheel flanges at all frogs and switches, and yet must not drop the smaller treads of the trolley wheels and derail the cars. In such cases spring rail frogs are used, so placed that in the single spring-rail type the open flangeway is parallel with the trolley run, making a practically unbroken main line for the narrow treads of the surface street car wheels. Where both runs in a branch-off curve are used by surface street cars, double spring-rail frogs are put in, and in crossings of acute angles the side frogs are of the movable-point type, operated simultaneously with the throwing of the switches, which is done either from a tower or by ground throws, depending on the importance of the junction. All our T-rail track is so constructed as to be capable of carrying heavy steam road traffic. The foundation for the ties, which are 6 ins. x 8 ins. 8 ft., is sand, well tamped under and around the ties. A ballasting of cinders is spread over the top of the roadbed to a depth of half the height of the rail; this prevents dust from flying at the rear of a rapidly moving train or car.

Bonding in Rochester

New York, Sept. 17, 1901.

Editors Street Railway Journal:

I have just read the article upon "Track Bonding," by Alfred Green, master mechanic of the Rochester Street Railway Company, published in your number of Sept. 14, and note his references to plastic bonds. It is possible that he has overlooked the record made by the plastic bonds upon his own road.

In September, 1896, I received from this road an order for fifty bonds, to be used on their St. Paul Street Railway line, and 425 for their West Avenue line. I was given to understand that the rail weighed 90 lbs. to the yard, and had a clearance of ⅜ in. between web of rail and angle plate.

The bonds that were shipped were, therefore, fitted to this size of rail. A short time afterward the manager of the road, who has since left them, informed me that the clearance was about half the size above stated, and that the bonds, therefore, had hardened under the pressure put upon them.

I told him that though the mistake was not mine, I should assume the responsibility of any trouble which occurred within three years. I have before me letters recently written by T. J. Nicholl, the present general manager of the road, in which he states that the depreciation of these bonds, after practically five years' service, is shown to be 5 per cent.

This is but 1 per eent per annum, and proves that the track work was excellently well done, and that, therefore, none of the troubles have occurred which Mr. Green fears from any kind of bond. Mr. Green is right in his statement that if the joints are allowed to come loose any type of bond will give out, but in this case the blame should be laid upon the joint, and not upon the bond.

There are several rail-joints upon the market which will not loosen in service, and there are efficient spring lock washers for keeping ordinary splice bars tight. When these are used, or even when as much as ⅛ of an inch leeway is allowed for joint expansion or contraction, plastic bonds can be applied that will give practically the full eonductivity of the rail, and maintain it for years.

The bonds at Rochester are applied under one angle-plate only, and their conductivity, therefore, could not be greater than that of the plate itself.

Harold P. Brown.

The Metropolitan Express and the Convention

It is illustrative of the scope of the express business now being done on the lines of the Metropolitan Street Railway, New York, that the Metropolitan Express Company, which gives the service, has sent out a circular letter to the exhibitors at the coming street railway convention offering to quote prices on the shipment of exhibits in the city to the convention hall at Madison Square Garden by means of its trolley express cars, electric vehicles, horses and trucks.

Annual Report of the Metropolitan Street Railway Company

The annual report of the Metropolitan Street Railway Company for the year ending June 30, 1901, furnished to the Railroad Commissioners at Albany on Sept. 14, makes the following showings and comparisons:

	1901	1900
Gross earnings	$14,063,781.92	$13,785,083.94
Operating expenses	6,755,130.94	6,631,253.66
Surplus	$7,308,650.98	$7,153,830.28
Fixed charges	4,534,068.22	4,445,720.44
Net earnings	$2,774,582.76	$2,708,109.84
Other income	656,984.63	652,049.70
Net income	$3,431,567.39	$3,360,159.54
Dividends declared	3,393,262.25	3,145,891.00
Surplus over dividends	$38,305.14	$214,268.54

These figures are based on the same track mileage as last year, and, except for the final thirty days, cover operation on main lines by the old cable. This practically excludes from the showing any of the economies resulting from the conversion from cable to electric traction, the full effect of which will be apparent during the current year.

During the last half of the year covered by the report dividends were paid on $52,000,000 instead of $45,000,000, as formerly. The increased cost of operation was made in the period during which the company's main lines on Broadway, Columbus Avenue and Lexington Avenue were under alteration from cable to electric traction.

A New Electrical and Steam Supply House

The firm of the Charles E. Dustin Company commenced business on Sept. 17. The president of the company, Charles E. Dustin, was, until that date, president and general manager of Rossiter, McGovern & Company. It has been known for some months that Mr. Dustin would sever his connection with Rossiter, McGovern & Company, but that he is to start a new company in the same line comes as something of a surprise to his numerous friends in both the railway and general electrical field. The new company has secured offices at the Bowling Green Building, 11 Broadway, New York City, and proposes to engage in the purchase and sale of all kinds of electrical machinery, engines, boilers, etc., and also to undertake a general engineering business such as the construction of electric and steam plants and other work. W. S. Barstow, formerly general manager of the Edison Electric Illuminating Company, of Brooklyn, whose recent start as a consulting engineer was noted in these pages last week, has been retained as consulting engineer for the new company, and will devote a large part of his time to its interests. The capital stock of the Charles E. Dustin Company is $250,000, and the company will be fully prepared to cover all special branches of the business which it expects to undertake. Mr. Dustin, who is the president of the new organization, is peculiarly fitted for the business of buying and selling second-hand material, having long been identified with electrical companies as a confidential financial expert in these lines. He was the founder of the well-known Schuyler Electric Company, which was afterward absorbed by the General Electric Company, and was later made receiver of the Excelsior Electric Company, of New York, during the negotiations which were then being made to purchase the Excelsior Company by the General Electric Company. It was through his receivership in this company that he became connected with Rossiter, McGovern & Company, when, as it will be remembered, they bought the Brooklyn plant of the Excelsior Company for their own repair business. The new firm, therefore, starts out under the most satisfactory conditions, Mr. Dustin's large acquaintance making him an ideal man for its head, and the many advantages offered by this field for a company competent to maintain a business of this kind will undoubtedly make it a success.

Street Railway Patents

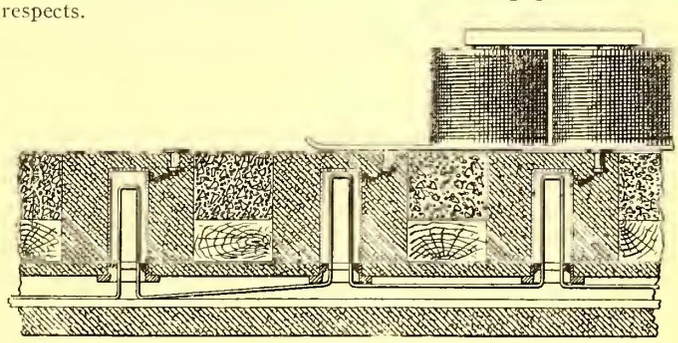
[This department is conducted by W. A. Rosenbaum, patent attorney, 177 Times Building, New York.]

UNITED STATES PATENTS ISSUED SEPT. 10, 1901

682,165. Contact Device for Electric Railways; W. M. Brown, Johnstown, Pa. App. filed Jan. 8, 1901. A stud contact system in which the connection inside of contact boxes is made by means of a magnet carried by the car.

682,187. Trolley Wire Support; W. Gerard, St. Bernard, Ohio. App. filed Jan. 17, 1901. A clamp forces the wire into a deflected groove in the clip and holds it in place.

682,267. Gripping Device for Suspended Cable or Rope Railways; R. Pfaffenbach, Leipsie, Germany. App. filed May 11, 1901. To insure equal pressure of both wheels of a trolley which traverses the cable, one of the jaws of the gripping device is attached to the framework of the hanger carrying the load, instead of the frame connecting the driving wheel, the other parts being correspondingly arranged to retain the automatic action of the grip in all other respects.



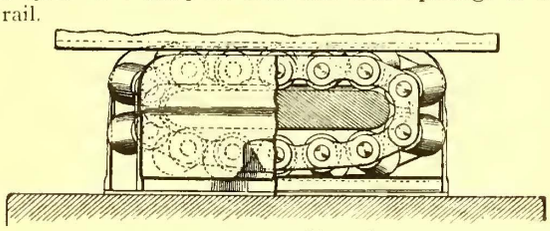
PATENT NO. 682,381

682,273. Car Truck; W. E. Prindle, Johnstown, Pa. App. filed Oct. 24, 1900. The truck is constructed so that the length of the wheel base can be changed without changes in the pattern and frame castings.

682,348. Car Truck; A. A. Ambler, Chicago, Ill. App. filed Nov. 24, 1900. A rigid wheel encompassing frame, a bolster having the pivot seat for the car body; a plate having an aperture to accommodate such pivot seat; and four diagonal strain rods, located in line two and two through the axis of the bolster pivot, and connected at their opposite ends respectively to such apertured center plate, and to the wheel pedestal.

682,381. Electric Traction Road; L. Dion, Boston, Mass. App. filed Jan. 28, 1901. A continuous conductor located in a sealed conduit, has upward extensions, reaching near to the surface, so that they may be lifted by a magnet carried by the car, to close the circuit to the studs on the surface.

682,400. Rail-Joint; A. W. Beach, Knoxville, Pa. App. filed July 12, 1901. The fish-plate interlocks with openings in the web of the rail.



PATENT NO. 682,406

682,406. Roller Side Bearing; F. K. Fassett, St. Louis, Mo. App. filed March 13, 1901. The rollers are hung in an endless chain, and are brought successively into action between the bearing surfaces.

682,413. Switch Operating Mechanism; T. B. Kelsay, Meadville, Pa. App. filed Jan. 16, 1901. The switch is moved mechanically by pressure from the car upon one or the other of two levers.

682,428. Station Indicator; E. A. Russell, Newark, Ohio. App. filed Aug. 16, 1900. Trolley current is utilized through a solenoid to move an endless belt containing the names of the streets or stations.

682,457. Emergency Brake; J. L. Cushing, Lowell, Mass. App. filed Oct. 11, 1900. The brake is a wedge, adapted to be inserted between a fixed frame and the rim of the wheel.

682,540. Electric Switch; C. E. Gaffney, Pawtucket, and F. A. Tibbetts, Providence, R. I. App. filed May 20, 1901. Devices for easing the motion of the switch point.

ENGINEERING SOCIETIES

THE FRANKLIN INSTITUTE.—A State meeting of the physical section of the Institute will be held Wednesday, Sept. 25. Programme: Crystallization under Electro-Static Stress. (Second communication.) Dr. Paul R. Heyl. A series of reviews of recent progress in the following branches of physical science: "Light," Dr. Horace C. Richards, University of Pennsylvania. "Electricity," Dr. Morton G. Lloyd, University of Pennsylvania. "Heat," William McClellan, University of Pennsylvania. "Sound and Molecular Physics," Dr. George F. Stradling, Northeast Manual Training School.

PERSONAL MENTION

PROF. WILLIAM ESTY, formerly of the University of Illinois, has become connected with Lehigh University in its Department of Electrical Engineering.

MR. J. H. GREEN, formerly superintendent of the Bangor, Hampden & Winterport Street Railway, has been appointed superintendent of construction for the Bangor Street Railway, Bangor, Hampden & Winterport Street Railway, and Bangor, Orono & Old Town Street Railway, and he will have entire charge of these properties.

MR. WILLIAM H. SNOW, for the past several years superintendent of the Bangor Street Railway, has been appointed superintendent of operations of the Bangor, Hampden & Winterport Street Railway, and Bangor, Orono & Old Town Street Railway. Mr. Snow will continue to act in the same capacity for the Bangor Street Railway.

MR. WILLARD A. COCKLEY, formerly with the Shelby Steel Tube Company, and lately sales agent for the Runskool Metal Company, has accepted a position on the selling staff of the Mayer & Englund Company, of Philadelphia. Mr. Cockley will take charge of sales in New York State and Northern New Jersey, with headquarters at the company's office, 85 Liberty Street, New York City.

MESSRS. H. F. PARSHALL AND PHILIP DAWSON, of London, have been retained by Mr. C. T. Yerkes to report on the applicability of the three-phase systems of electric traction in use on the Continent to London underground work. In carrying out this undertaking Messrs. Parshall and Dawson will visit the various installations in Europe on which three-phase motors are being employed.

MR. CURTIS J. HARRINGTON, well known in the street railway trade, formerly with Elmer P. Morris & Company, and recently manager of the electric railway department of F. H. Lovell & Company, has taken an interest in the firm of H. M. Shaw & Company, 115 Broadway, New York. Mr. Harrington's experience in the electrical field will place this firm in the foremost ranks of manufacturers of high-grade material for electric railway purposes.

MR. M. F. BURKE, who has been superintendent of the Terre Haute Electric Company, of Terre Haute, Ind., since 1889, has resigned, to become general superintendent of the El Paso & Juarez Avenue Street Railway Company, of El Paso, Tex., recently purchased by Messrs. Stone & Webster, of Boston. Mr. Burke recently passed through New York en route for Boston, where he will confer with Messrs. Stone & Webster, and he will then start for El Paso, and will assume his new duties immediately after his arrival in that city.

MR. WILLIAM A. HOUSE, general manager of the United Railways & Electric Company, of Baltimore, has been appointed assistant to the president in connection with his managerial duties. The duties of the assistant to the president will be to carry out all the orders of the executive, thus relieving the head of the company to that extent. The other officers will report to the assistant, and will be subject to his orders, with the approval of the president. He will, in a word, have direct and full supervision of the practical workings of the company.

MR. C. O. SIMPSON, who has recently been elected to an important position with the Birmingham Railway, Light & Power Company, was formerly auditor of the Augusta Railway & Electric Company, of Augusta, Ga. Mr. Simpson was connected with the Augusta company for three years, and previous to that time he was associated with a company at Kansas City. The employees of the Augusta Railway & Electric Company sincerely regret that Mr. Simpson has severed his connections with the company, but they extend to him their best wishes, and hope for his future success.

MR. J. WILLIAM HELM, formerly secretary and treasurer of the North Chicago Street Railroad Company, and who, for more than ten years, was connected with the North and West Chicago Street Railroad Companies and the Chicago Union Traction Company, has taken the position of general manager of the Green Engineering Company, of Chicago, under the reorganization of the Green Engineering Company, manufacturers of the Green traveling-link chain grates. The officers of the company are: P. Albert Poppenhusen, president, and Thomas A. Poppenhusen, secretary and treasurer, while the office force and correspondence is in charge of J. William Helm.

MR. S. ROY WRIGHT, who will be remembered by street railway men as formerly superintendent of the West End road at Denver, Col., before the consolidation there, has become general manager of the Colorado Springs Rapid Transit Railway, which is undergoing a much-needed reconstruction. Mr. Wright is the right man to handle the Colorado Springs property at this important period of changes and extensions. These changes were necessitated not only by the condition of the system, but by the prosperity and rapid growth now going on in Colorado Springs and vicinity.

MR. WILLIAM S. ALDRICH, consulting engineer of Toronto, Canada, has been appointed to the directorship of the Thomas S. Clarkson School of Technology, Potsdam, N. Y. This school has been undergoing a reorganization of the courses, new instructors have been appointed and additional equipment provided. There are to be regular four-year engineering courses in theoretical and practical work leading to the degree of Bachelor of Science in Civil, Electrical and Mechanical Engineering. The appointment of Mr. Aldrich as director insures a thorough school.

MR. and MRS. H. A. EVERETT, accompanied by James Fitzgerald, Mr. Everett's private secretary, have left Cleveland for a tour of inspection over a number of the properties of the Everett-Moore syndicate. They went first to London, Ontario, where they will inspect the city lines of that place, and will attend Western Ontario fair. From there they go to Port Huron; to Detroit over the Detroit & Port Huron Shore Line & Rapid Railway. The Detroit city lines and the other Michigan interurbans will be inspected, and then the party will run to Toledo, where the city lines will be inspected. The route to Cleveland will be over the Toledo, Fremont & Norwalk, Sandusky, Norwalk & Southern, Sandusky & Interurban (as far as completed), and then over the Lorain & Cleveland. The runs over the various lines will be made in special cars, which will be given right of way with a view to making fast time. The inspection tour will extend over a week.

MR. WILLIAM WAMPLER has recently resigned from the Peckham Manufacturing Company to act as New York representative of the Stuart-Howland Company, of Boston, dealers in electrical supplies and specialties. Mr. Wampler, who is thirty-two years of age and a native of Crawford County, Pa., has had an experience of twelve years in electric railway work. His first experience in electrical work was with the roads at Pittsburgh, and before he left that city he was a division superintendent. Then for a year and a half he was mechanical superintendent of the Union Railway Company, of New York, but resigned that position to accept that of master mechanic of the Atlantic Avenue Railway Company, of Brooklyn, now a part of the Brooklyn Heights Railroad Company. He continued with this company till 1894 when he accepted the position of superintendent of rolling stock and equipment of the Union Traction Company, of Philadelphia. This company at the time had 3000 complete car equipments and sixteen car houses and shops. He remained with that company for four years, then, in 1898, joined the forces of the Peckham Manufacturing Company, for whom he has acted as traveling salesman and also as superintendent of the Price .Brake Company. Mr. Wampler has many friends in the street railway business. He will act for the Stuart-Howland Company as traveling salesman in New York, Pennsylvania, New Jersey, Delaware and Maryland.

WILLIAM WAMPLER

FINANCIAL INTELLIGENCE

THE MARKETS

The Money Market

WALL STREET, Sept. 18, 1901.

Thanks to the efforts of the leading New York bankers and to the efficient co-operation of the heads of the Treasury Department, the money market has passed through a critical period without the least trace of disturbance and with scarcely any departure from normal conditions. The preparations which were made against the first shock occasioned by the shooting of the late President two weeks ago, proved to be an ample safeguard in the second crisis which his sudden and unexpected death precipitated at the close of last week. During the last five days upward of $8,500,000 has been paid over by the local Sub-Treasury direct to the banks on account of the tender of bonds advertised in Mr. Gage's $20,000,000 redemption offer of last week. In addition to this, the Secretary announced on Monday that interest, amounting to $4,700,000 on the government debt due the first of October, would be paid immediately. The release of these Treasury funds, coming on top of a heavy loan contraction which at the close of last week had served to counterbalance further currency withdrawals by the interior banks, has naturally caused a decided relaxation in the money market. Rates for money on call, which ran up as high as 9 per cent last Friday, have fallen to 5 per cent and under, while the supply of time money at 5 per cent for all dates is fairly large. It is commonly realized, however, that the relief so far obtained at the Treasury is only temporary, and that any further help from the same quarter is a very uncertain dependence. Even though the time for presenting government bonds for redemption under the emergency offer has been freely extended, it is doubtful whether anything like the entire $20,000,000 will be forthcoming. The government interest might be anticipated for several months, as was done in the autumn of 1899. But at the present rate of surplus revenue absorption, the sum thus returned to the market would be inconsiderable. There is no doubt that financial sentiment is fully aroused to the necessity of some radical change in the fiscal and banking laws, and that strong pressure will be brought to bear upon the Congress which meets in December for suitable legislation. But in the meantime the main source of relief lies rather in the foreign money markets than in extraordinary action by the Treasury. The rate for sterling exchange has declined still further during the past week, and is now within a half cent in the pound of the recognized level of specie imports. But the chances for immediate imports of gold have been somewhat diminished by the easing of the local money market, and it is a question whether the gold movement will begin until money rates harden again. At the same time the banks of England and France have raised their selling price of gold, indicating that while they will not oppose gold exports to this country, they will endeavor to keep them within moderate limits. Summing up, it would seem that the New York banks have enough to go on for another fortnight with what they have received from the Treasury, and that afterward they will be able to sustain their resources until the end of the crop-moving season by drawing gold from abroad. The situation, however, calls for the exercise of the utmost conservatism in restricting the demands of borrowers, and for this reason maintenance of the present comparatively high money rates is to be expected.

The Stock Market

The period since the last of these articles was written has witnessed a sensational decline and an even more sensational recovery upon the Stock Exchange. When the approaching death of President McKinley was first realized on Friday morning a good part of Wall Street looked forward to a panic. Liquidation by speculative holders went on enormously during Friday's session, and prices of the leading stocks dropped from 4 to 7 points. But while the market was extremely weak, it was prevented from becoming badly demoralized by the support of banking interests and the other great financial houses, which were openly buying in seemingly unlimited quantity throughout the day. Wall Street has probably never seen a more striking case where powerful and well-organized capital has stepped in to avert a panic and has been more completely successful. The assurance of this support and the time allowed for quiet deliberation by the suspension of business on Saturday, served by the opening on Monday to produce a complete change in financial sentiment. Liquidation among outside holders of stocks ceased immediately, investment buying orders poured in from all sources, and the large professional contingent which had sold short in anticipation of a serious break hastened to bid in their contracts. The result of these combined influences was one of the most remarkable recoveries ever witnessed on the Stock Exchange. The whole share list by yesterday morning was back to where it was a week ago, and in numerous instances prices were even higher. That President Roosevelt's pledge to follow consistently the policies of his predecessor had a good deal to do with this recuperative movement, can not be doubted. But beyond this it was a most notable expression of confidence in the stability of investment values in securities and in the prosperity of the country. The time is not propitious for a continuance of the upward tendency more than as it has retraced the ground lost a week ago. But there is no question that the great demonstration of rallying power has largely increased confidence in the underlying strength of the market for the future.

Among the local traction stocks, Manhattan has been one of the most conspicuous feature in the recent recovery. The 7-point rise, in less than two days, bears out the assertion frequently made in these columns that the stock has never been more closely held at any time in its history, and that the reason for this is that the majority of the present holders are convinced that values will be considerably higher when electrical equipment is finally installed, and are content to wait for this time to come. A large amount of buying has come from brokers who usually handle inside accounts, and in addition local politicians are believed to have purchased heavily. Apart from the general and technical considerations already described, however, no reason for the week's movement is apparent. Metropolitan and Brooklyn Rapid Transit have responded only indifferently to the rise in Manhattan. The execution of a large liquidating order "at the market" is what caused the extreme break in the Brooklyn specialty on Friday. The stock was taken by the interests which have been active in supporting it in the past. Trading in Metropolitan, both during the decline and the rally, was comparatively light, showing no particular desire either to sell or to buy the stock.

The Curb Market

The general disturbance of the past week did not affect the curb market for street railway issues. The demand for United Railways of St. Louis preferred continues to absorb all offerings. Seven hundred shares have sold during the last few days at 82¼. New Orleans common is back again to 29, following a similar reaction in the New Orleans market. Reports from that center would seem to indicate that the decline was due to realizing by those who had bought in anticipation of the change of control and combination plans announced a week ago. It was then unofficially stated that the purchase price was $35, or 6 points above the present quotation. There is no change in Columbus common, but the preferred has risen 2 points to 104. North Jersey is up a point to 23½, and the bid on Indianapolis has been lowered from 45 to 44½.

Philadelphia

Consolidated Traction of Pittsburgh sold as high as 23⅞ last Wednesday, but during the rest of the week the quotation was nearer 23. Trading in the stock was unusually active, but the way in which the price hangs shows that the speculative community is still uncertain about the deal with the Philadelphia Company going through. As has already been pointed out, the equivalent of conversion into Philadelphia Company stock is about $25 per share, and the inducement held out to the present Pittsburgh stockholders is that the new stock will pay a dividend, while the present stock does not. It would appear, however, that many of the traction company shareholders are skeptical about the consolidated company being able to pay dividends on the common stock for very long, and, considering that their road is earning now some 3 per cent on its common issue, are rather disinclined toward the proposed exchange. Union Traction has followed the course of the general market consistently, breaking to 27⅞ on Friday and rallying to 29 when the general list recovered. There is no fresh news about the property, but the speculative gossip, for which there is some apparent foundation, is that the stock is held uncommonly close, and that insiders are having no trouble in supporting it. Philadelphia Traction, "ex" the quarterly dividend of 2 per cent, is fractionally lower at 95¾. American Railways is firm with little doing around 40. Railways General is unchanged at 2¼. The company's meeting, which is expected to authorize the proposed reduction in the capital stock, has been postponed until Sept. 30. In bonds, sales are reported of Consolidated of New Jersey 5's at 109½, Indianapolis 4's at 83 and Electric People's 4's at an advance from 96 to 96¾.

Chicago

The four business days since last Wednesday have brought little change to the Chicago traction market. Elevated stocks are selling practically at the same figures as a week ago, and dealings in them have been trifling. The negotiations for the lease of the St. Paul's Evanston branch by the Northwestern Elevated are progressing favorably, and Mr. Earling, the St. Paul president, says the hitch is in the price only. There has been some talk of a general strike among the elevated lines. The newly-formed union of the employees claims to have certain grievances which, unless compromised, threaten to cause trouble. Union Traction securities are a fraction lower on the week. The road has made a protest against the recent raising of its assessment, and it is also probable that the elevated companies, whose aggregate tax valuation has been increased from $6,600,000 to $29,657,000, will carry the matter before the courts. This tax question, however, like the one of renewing the franchises, will doubtless hang fire for a considerable length of time, and will keep the whole traction market more or less unsettled.

Stock Quotations

The following table shows present bid quotations for the leading traction stocks, and the active bonds, as compared with a week ago; also the high and low since Jan. 1, 1900:

	Jan. 1, 1900 To Date		1901 Closing Bid	
	High	Low	Sept. 11	Sept. 17
American Railways Co.	48¼	27	40½	40
Boston Elevated	192	b95	167	172
Brooklyn R. T.	88⅞	47⅛	67⅝	65¼
Chicago City	†285	200	207	a205
Chicago Union Tr. (common)	..	..	17	16¾
Chicago Union Tr. (preferred)	..	..	58	58
Columbus (common)	48	20	45	45
Columbus (preferred)	103	80	102	104
Consolidated Traction of N. J.	69½	57	66	66
Consolidated Traction of N. J. 5s	110	..	109¼	109
Consolidated Trac. of Pittsburgh (common).	30¼	20¼	23½	23¾
Indianapolis Street Railway	48¾	15	45	44½
Lake Street Elevated	16¼	6½	12⅞	12½
Manhattan Ry.	131¾	84	116¾	119⅛
Massachusetts Elec. Cos. (common)	43¼	15	38¼	35
Massachusetts Elec. Cos. (preferred)	96	70	a94	92½
Metropolitan Elevated, Chicago (common)..	38	24½	37	37
Metropolitan Elevated, Chicago	98½	70	93	92
Metropolitan Street	182	143¾	164	162
Nassau Electric 4s	97½	..	97½	97½
New Orleans (common)	33½	18¼	33	29
New Orleans (preferred)	108	90	107	104½
North American	*106	*74	96	97
North Jersey	36	21	22½	23½
Northwestern Elevated, Chicago (common).	52	..	41	40
Northwestern Elevated, Chicago (preferred).	97½	..	88	85
Rochester	31½	12	30	30
St. Louis Transit Co. (common)	35	16½	26	26½
South Side Elevated (Chicago)	119	93	110	109½
Syracuse (common)	b23	10½	23	23
Syracuse (preferred)	b65	25	63	63
Third Ave.	135⅛	45¼	120	120
Twin City, Minneapolis (common)	105¼	58½	102	102¼
United Railways, St. Louis (preferred)	82	..	80	82
United Railways, St. Louis, 4s	91½	..	89	89⅜
Union Traction (Philadelphia)	40⅛	24¼	29	28¾
United Traction (Providence)	110	107	109	109

a Asked. b Bid. * Quotation of new stock. † High quotation previous to the issue of new stock.

Iron and Steel

The great strike of the steel workers is at an end, and the industry can safely look ahead to an indefinite period of freedom from labor disturbances. It is too early yet to judge what the effect will be on the trade markets. The mills, however, will be rushed to their utmost limit to catch up with business on hand, and this should have a tendency to check the advance in prices, which has made considerable headway during the last month. Consumption of all finished materials continues very heavy. The situation in the lower handlers of the industry is also healthy. The *Iron Age* reports a decrease from 297,269 to 293,256 tons in the weekly capacity of the coke and anthracite furnaces during August and a further decrease of 10,000 tons in furnace stocks.

Bessemer pig is quoted at $15.50@$15.75, steel billets at $25 and steel rails at $28.

Metals

Quotations are as follows: Copper, 16½ cents; lead, 4⅜ cents; tin, 25.40 cents, and spelter, 4 cents.

SAN FRANCISCO, CAL.—The negotiations that were being conducted for the sale of the Market Street Railway to an Eastern syndicate have been dropped. J. T. Blackwell and G. R. Webb, of Baltimore, and R. G. Hanford, of San Francisco, were acting as promoters of the deal. It is reported that the best offer made was to put up a sixty-day option of $100,000 to take a bare majority of the stock at $105 per share, which would make the purchase price about $9,774,000. It is said that H. E. Huntington refused to consider any offer of less than $120 per share.

BOULDER, COL.—The Boulder Railway & Utility Company has had filed for record a mortgage for $200,000 that covers its entire plant and equipment. The mortgage is given in favor of the Royal Trust Company, of Chicago, and the proceeds of it will be used to retire an outstanding issue of bonds and for the general improvement of the property. Only a portion of the bonds will be issued at this time.

BLOOMINGTON, ILL.—There has been a reorganization of the Bloomington & Normal Railway Company, and its capital stock has been increased from $250,000 to $600,000. The name of the company has been changed to the Blomington & Normal Railway, Power, Light & Heating Company, and the object of the reorganization is said to be to perfect the consolidation of the company with the Bloomington Electric Light Company and the City District Heating Company.

BOSTON, MASS.—In accordance with the provisions of the lease of the West End Street Railway Company to the Boston Elevated Railway Company, a dividend rental of $1.75 per share will be paid to holders of record of West End Street Railway common stock on Oct. 1.

AMHERST, MASS.—The stockholders of the Amherst & Sunderland Street Railway Company have voted to issue additional stock to the amount of $5,000 to pay for the extension to Mill Valley, and also to issue $30,000 of bonds to pay for the extension to Sunderland. A committee consisting of President Cowles, Treasurer Mason A. Dickinson and Superintendent L. N. Wheelock has been instructed to push to a favorable ending the movement to extend the company's lines from Mill Valley to the South Hadley line to connect with the Holyoke line.

BILOXI, MISS.—The stockholders of the Biloxi Street Railway Company have unanimously agreed to dissolve the corporation and divide the moneys on hand. There were assets sufficient to pay 50 per cent of the par value of the stock, which have been distributed pro rata. There are still other assets on hand, which, when realized upon, will give the stockholders about $500 more for distribution. The company has, however, determined to retain its charter. The company has been inoperative for about a year.

KANSAS CITY, MO.—The formal consolidation of the Leavenworth Electric Railway Company, Kansas City-Leavenworth Railway Company, Kensington Railway Company, Leavenworth & Lansing Railway Company and the Kansas City & Leavenworth Traction Company has been perfected and approved by the State authorities. The consolidated company is known as the Kansas City-Leavenworth Railway Company. The officers of the company are: David H. Kimberly, of Cleveland, president; W. H. Gabriel, of Cleveland, first vice-president; Henry C. Ellison, of Cleveland, second vice-president; Herbert W. Walcott, of Leavenworth, secretary; Charles O. Evarts, of Cleveland, treasurer. The officers and Charles F. Hutchins, of Kansas City, Kan.; Charles H. Wheeler, of Akron, Ohio, and U. G. Walker, of Cleveland, constitute the board of directors.

NEW YORK, N. Y.—It is stated that application will be made to the Stock Exchange, probably in October, to list the securities of the American Light & Traction Company. The company was organized in New Jersey to acquire the capital stocks of other corporations. The authorized capital stock is $40,000,000, divided into $25,000,000 of preferred stock and $15,000,000 of common stock. About $6,000,000 of preferred stock and about $4,000,000 of common stock have so far been issued. The following is a list of the companies in which a majority of the capital stocks have been acquired: The Western (Milwaukee) Gas Company, Grand Rapids (Michigan) Gas Light Company, St. Joseph (Missouri) Gas Company, Madison (Wisconsin) Gas & Electric Company, St. Paul Gas Light Company, Binghamton (New York) Gas Works, and the Southern (San Antonio, Tex.) Light & Traction Company. These companies have issued bonds aggregating about $13,200,000.

BUFFALO, N. Y.—Justice Lambert, in Special Term of the Supreme Court, has granted to George W. Houck, temporary receiver of the Buffalo, Harburg & Aurora Railway Company, power to issue $10,000 worth of receiver's certificates, the money to be used for the operation of the road.

UTICA, N. Y.—The Utica & Mohawk Valley Railroad Company has purchased of the Herkimer & Little Falls and the Utica & Frankfort Railway Companies their stocks and all the rights, franchises and privileges to construct a road between Little Falls and Herkimer. Three companies, the Mohawk Valley Traction, the Utica & Mohawk Valley Railroad Company and the Herkimer & Little Falls Railroad Company, were trying to construct lines between Little Falls and Herkimer, and the Herkimer & Little Falls Company, whose principal stockholder was Thomas O'Shea, of New York, held franchises. The other two tried to obtain franchises over the same route. The authorities did not take to granting two or three franchises, and two companies were unsucessful in their efforts. The Mohawk Valley Traction Company claimed the O'Shea franchises were void. The Cleveland capitalists looked the matter up and found them to be valid. At a hearing before the Little Falls Common Council the local company made the announcement that it had bought up the O'Shea franchises. By doing this the Cleveland people gained a decided victory over the Mohawk Valley Traction Company. This move was not looked for by any. The Cleveland people also attained the rights to construct a line through the streets of Little Falls. Work has already been started on this branch.

HUDSON, N. Y.—The annual report of the Albany & Hudson Railway & Power Company for the year ending June 30 shows:

Gross receipts	$102,810
Operating expenses	91,874
Earnings from operation	$10,936
Receipts from other sources	19,575
Gross income	$30,512
Fixed charges	205,213
Net earnings	*$174,701
Total deficit	126,902

* Deficit.

CLEVELAND, OHIO.—The first report of receipts ever compiled by the Lake Shore Electric Railway has been issued, and indicates that the gross earnings for the month of August were $44,900. This company is the recent consolidation of the Lorain & Cleveland Railway, Sandusky & Interurban Railway, Sandusky, Norwalk & Southern Railway and Toledo, Fremont & Norwalk Railway. The entire system is not fully in operation, but the links are rapidly being closed up, and it is announced that through cars will be placed in operation from Cleveland to Toledo by Oct. 15.

CLEVELAND, OHIO.—The Southern Ohio Traction Company reports earnings as follows:

August	1901	1900
Gross receipts	$39,915	$30,201
Operating expenses	18,450	15,205
Earnings from operation	$21,465	$14,996
Jan. 1 to Sept. 1		
Gross receipts	$218,736	$188,056
Operating expenses	122,479	98,888
Earnings from operation	$96,257	$89,168

CLEVELAND, OHIO.—The Toledo & Western Railway, of which Hon. Luther Allen is president, has filed a mortgage in Toledo in favor of the Western Reserve Trust Company, of Cleveland, securing the payment of an issue of $1,250,000 of 5 per cent gold bonds. The mortgage covers all the property of the company in Lucas and Fulton counties, Ohio and Lenawee County, Mich. The road is already in operation in these counties.

STEUBENVILLE, OHIO.—A newspaper report intimates that the Everett-Moore syndicate has secured control of the Steubenville, Mingoe & Ohio Valley Traction Company, which operates about 12 miles of road running through Steubenville, and which is being extended to Brilliant. Neither Mr. Everett nor Mr. Moore is in Cleveland, but Guy S. Walker, statistician for the syndicate, states that the Everett-Moore combination is making no attempt to acquire property in that section of the State. The report probably arose from the fact that Mr. Moore is a director in the Wheeling Traction Company, which is planning a number of extensions into Ohio, among them a road to Steubenville from Bridgeport. The road above referred to covers a portion of this route. The Wheeling Traction Company has nothing in common with the Everett-Moore syndicate as a whole, none of the members of the syndicate being identified with it except Mr. Moore.

CLEVELAND, OHIO.—It is again stated the Everett-Moore syndicate will shortly gain control of the Cleveland City Railway Company. It is stated that a meeting of officials of both of the Cleveland companies was held last week, when the Everett-Moore syndicate is said to have made a proposition of 125 for a controlling interest in the stock of the Cleveland City Railway Company. It is said that 150 was demanded. The Cleveland Electric, an Everett-Moore property, is earning 5 per cent on a stock valuation of 88, while the other company is earning the same per cent on a stock valuation of 130. It is said that the Everett-Moore syndicate is very confident that the Hanna pool in the Cleveland City Railway Company can not be long maintained, and if a break in the members of the pool occurs the Everett-Moore syndicate is certain to secure a controlling interest, as its holdings are already very large.

CLEVELAND, OHIO.—A report comes from Toledo to the effect that the Everett-Moore syndicate has acquired the Toledo & Maumee Valley Railway running from Toledo to Perrysburg. It is said that $750,000 was paid for the property, which consists of a loop line running on both sides of the Maumee River to Perrysburg, and it is over this road that a number of roads now building propose to operate into Toledo. The story can not be verified at the Everett-Moore headquarters, as the heads of the syndicate are all out of the city, but it has been known for some time that the Cleveland people have been negotiating for the property.

PITTSBURGH, PA.—The Consolidated Traction Company reports earnings as follows:

August	1901	1900
Gross receipts	$260,384	$240,934
Operating expenses	125,759	109,132
Earnings from operation	$134,625	$131,802
Five months		
Gross receipts	$1,305,351	$1,227,865
Operating expenses	626,193	584,515
Earnings from operation	$679,158	$643,350

PHILADELPHIA, PA.—The dividend of $2 per share on the stock of the Union Traction Company is payable Oct. 1.

Tables of Recent Traction Earnings

NAME	Latest Gross Earnings			Latest Net Earnings	
	Week or Month	1901	1900	1901	1900
American Rys. Co.	Aug.	$91,176	$81,813	$.....	$.....
Binghamton Ry. Co.	July	22,480	19,875	12,328	11,351
Brooklyn R. T. Co.	July	1,203,761	1,145,189	e445,266	474,541
Chicago & Mil.El.Ry.Co.	July	23,459	18,378	15,770	13,232
Cincinnati, Newport & Covington Ry. Co.	June	72,201	73,965	42,452	42,700
City Elec. (Rome, Ga.)	July	3,873	.....	e 260	.....
Cleveland & Eastern	Aug.	10,671	5,363	6,133	3,781
Cleveland El. Ry. Co.	July	210,329	181,856	101,210	87,977
Cleve., Elyria & Western	Aug.	27,307	.....	14,936	.....
Cleveland, Painesville & Eastern	July	19,143	16,605	11,393	11,057
Consolid. Tr. (Pittsburgh)	Aug.	289,103	268,919	163,345	159,788
Denver City Tramway	July	143,223	119,910	64,320	59,026
Detroit United Ry.	July	291,388	231,247	148,427	110,615
Duluth Superior Tr.	July	45,983	.....	23,866	.....
Herkimer, Mohawk, Ilion & Frankfort Ry. Co.	May	4,508	4,146	1,935	908
International Tr.	July	528,936	250,999	287,601	127,152
London St. Ry.	July	15,303	11,159	6,531	3,818
Montreal Street Ry.	June	180,371	168,244	.....	.....
Northern Ohio Traction.	Aug.	67,693	57,954	33,669	24,064
Olean St. Ry. Co.	July	5,954	5,115	3,748	3,199
Richmond Traction Co.	July	23,543	20,979	8,569	11,434
Rochester Ry. Co.	May	80,401	75,749	32,9 0	26,011
Scranton Ry. Co.	Aug.	63,763	57,647	30,019	27,713
Southern Ohio Trac. Co.	Aug.	39,915	30,201	21,465	14,996
Syracuse R. T. Ry. Co.	June	56,952	48,211	26,010	21,305
Twin City Rapid Transit.	July	290,649	249,842	155,299	129,331
United Tr. Co. (Albany).	July	134,370	126,121	54,732	47,466
United Tr. Co. (Pittsburgh)	Mar.	157,792	148,009	70,741	65,511

NAME	Gross from July 1 to Latest Date			Net from July 1 to Latest Date	
	Period Ending	1901	1900	1901	1900
American Rys. Co.	Aug. 31	$180,834	$166,412	$	$.....
Binghamton St. Ry	June 30	190,910	176,210	86,835	79,108
Brooklyn R. T. Co.	June 30	12101 198	11751595	e4130,563	e3,758,369
Chicago & Milwaukee El. Ry. Co.	a July 31	88,920	71,565	46,829	40,828
Cincinnati, Newport & Covington Ry. Co	a June 30	384,638	369,938	223,546	220,145
City El. (Rome, Ga.)	a July 31	24,138	.....	e 2,970	.....
Cleveland El. Ry. Co	a July 31	1,264,620	1,147,653	565,227	511,572
Cleveland, Elyria & Western Ry. Co.	a Aug. 31	158,563	112,186	70,122	40,349
Cleveland, Painesville & Eastern	a July 31	84,592	74,854	40,614	35,715
Consolid. Tr. Co. (Pittsburg)	d Aug. 31	1,448,854	1,379,544	822,662	785,039
Denver City Tramway	a July 31	838,502	722,301	378,268	304,849
Detroit United Ry.	a July 31	1,554,934	1,381,976	717,462	603,864
Herkimer, Mohawk, Ilion & Frankfort Ry. Co	May 31	48,895	47,026	20,247	21,063
International Tr.	May 31	2,698,332	2,331,632	1,303,216	1,085,748
London St. Ry.	a July 31	75,416	60,629	26,698	13,475
Milwaukee El. Ry. & Lt. Co.	d June 30	918,104	830,674	426,071	389,333
Montreal Street Ry.	*June 30	1349,214	1,256,116	.....	.....
Olean St. Ry. Co.	June 30	52,018	48,700	25,790	22,997
Richmond Trac. Co.	c July 31	175,594	164,197	66,948	77,064
Rochester Ry	May 31	898,156	835,543	337,248	328,021
Scranton Ry. Co.	Aug. 31	127,958	116,843	62,318	55,507
Seattle Elec. Co.	d May 31	514,386	412,705	193,192	97,253
Southern Ohio Tr.	a Aug. 31	218,736	188,056	96,257	89,168
Syracuse R. T. Ry. Co	June 30	621,299	552,403	280,469	233,268
Twin City R. T. Co.	a July 31	1,748,182	1,575,641	924,502	807,433
United Tr. Co. (Albany)	June 30	1,340,356	.....	186,131	.....

* Nine months. † Caused by strike of employees. *a* From Jan. 1.
b Three months. *c* Ten months. *d* Five months. *e* Excluding taxes.

NEWS OF THE WEEK

CONSTRUCTION NOTES

MOBILE, ALA.—The County Commissioners have granted the Mobile Light & Railroad Company rights of way for the extension of its lines to Whistler, a distance of 5 miles, and also for some distance out both Government Street and Dauphin Way.

BIRMINGHAM, ALA.—The work of extending and improving the railway system of the Birmingham Railway, Light & Power Company is progressing rapidly. Gangs of men are daily employed in placing ties, new rails and changing grades, turnouts and tracks. A contract has recently been closed by the company with William Kingston, the Southern representative of the Lorain Steel Company, for rails to the amount of $52,000.

SACRAMENTO, CAL.—A sensational newspaper story says that Senator Clark, the Montana Copper King, is planning to construct an electrict railway from Salt Lake City to San Francisco. The report says that the route of the line has been laid out, and that the road will extend through Sacramento.

OAKLAND, CAL.—The Oakland Transit Company has made arrangements with the Bay Counties Electric Power Company for securing additional power from that company. The contract is for five years, with the power of renewal for five years.

VALLEJO, CAL.—H. F. Hartzell and J. W. Hartzell have been granted a fifty-year franchise to construct and operate an electric railway between Vallejo and Benicia. It has been learned from an authoritative source that the Bay Counties Power Company, whose power lines reach both towns, will furnish power for the line if constructed, and that it will also undertake to furnish or procure part of the capital for the enterprise.

ARVADA, COL.—Plans are now being discussed for the construction of an electric railway here. There have recently been several meetings of the citizens, and from the general interest displayed the construction of the proposed new lines is practically assured. Senator H. R. Brown and R. C. Green have interested themselves in the project.

DOVER, DEL.—The directors and stockholders of the Delaware General Electric Railway Company elected directors and officers for the ensiung year Sept. 10. The directors elected were as follows: Leo Belmont, Morris Bernheimer, S. F. Nixon, B. I. DeYoung and William Graham, all of Philadelphia; Robert C. White, of Georgetown, Del.; Dr. E. W. Cooper, of Camden, Del.; James Lord, of Dover, Del.; H. Huffmann Brown, Esq., of New York City. The directors elected the following officers: Leo Belmont, president; Robert C. White, vice-president; William Graham, secretary; Morris Bernheimer, treasurer. Enough material has arrived here for the construction of over half of the 35 miles of the road through Kent County, and as soon as the work is commenced, which will be in a few days, the balance of the rails, poles, etc., will be shipped.

ATLANTA, GA.—The City Council has granted a franchise to the Atlanta Rapid Transit Company to construct an electric railway connecting with its power house. The route of the line is from the corner of Gray Street on Jones Avenue to Davis Street, thence to Rock Street, there connecting with another line of the company. The franchise is for forty-eight years.

ATLANTA, GA.—The Mayor has vetoed the Boulevard franchise, which gives the Atlanta Rapid Transit Company the right to construct an electric railway along the Boulevard from Forest Avenue to Linden Street or North Avenue. It is understood that the principal reason for the veto is the length of the franchise, the term being for forty-eight years.

CHICAGO, ILL.—Much of the material to be used in the Douglas Park extension of the Metropolitan Elevated Railroad has arrived, and the remainder will be shipped as required. It is expected that the formal work of erecting the structure will be begun Oct. 1. Work on the short Garfield Park extension has not begun, but this will be completed as soon as the Aurora, Wheaton & Chicago Railway is ready for operation.

CHICAGO, ILL.—Fifteen motor cars and forty-five trailers were recently ordered for the Northwestern Elevated Railroad.

WINCHESTER, IND.—The County Commissioners have granted the franchise to the Eastern Indiana Traction Company for the right of way through the county for the proposed line between Richmond and Portland.

GOSHEN, IND.—The Goshen & Southern Traction Company has filed articles of incorporation with the Secretary of State. The purpose of the company is to build an electric railway to extend from Goshen to Winona Park, touching Warsaw, Leesburg, Milford and New Paris.

WABASH, IND.—The County Commissioners of Wabash have granted a franchise to the Wabash River Traction Company to extend its line from its western terminus to the Cass County line. The company is to begin work by June 1, 1902, and will be given two years from that date to complete the line and have cars in regular operation.

HOWELL, IND.—A. D. Jones, of Howell, is interested in organizing the Evansville, Mt. Vernon & New Harmony Railroad Company. The company will be organized with a capital stock of $50,000, and its purpose will be to construct an electric railway to connect Evansville, Mt. Vernon and New Harmony.

INDIANAPOLIS, IND.—The Indianapolis, Plainfield & Western Railway Company has awarded the contract for the construction of its proposed road to Plainfield to an Eastern company. The line will be 14 miles in length, and the contract stipulates that construction work shall begin within sixty days. The company has franchises for the use of the National Road in Marion and Hendricks Counties. No private rights of way will be needed. The line will pass through Ben Davis and Bridgeport. B. F. Nysewander is president of the company.

DES MOINES, IA.—The officials of the Interurban Railway Company, of this city, have anounced that the surveys for the extensive system of electric railways centering in Des Moines and extending over a considerable portion of the State of Iowa will be completed early next year, and that arangements had already been completed for financing the roads; also that the work of constructing one or two of the lines composing a portion of the system will be commenced this fall, and that it is their intention by this time next year to have in operation 200 miles of railway, if not more. They also stated that they expected ultimately to operate over 500 miles of electric railways in the State. The following is the programme of the company as outlined by the officials: The completion of grading on the Army Post line will be followed with construction work on the extension of that line to Indianola. The work of grading the line from Des Moines to Nevada, which is being constructed by the Des Moines, Eldora & Northern Railway Company, will also be rushed, so as to have the roadbed completed into Indianola and Nevada, thus admitting of track laying early in the spring. It is the ultimate intention to extend the Nevada line through Eldora to Waterloo and to absorb, if possible, a line now under construction from Waterloo to Denver. The line from Des Moines to Winterset will also be constructed next year, and it is the intention to extend the line through Greenfield to Creston. The line to Winterset will be an extension of the presnt Valley Junction line. From Valley Junction another line is to be constructed west through Adel, Panora, Guthrie Centre, Audubon and Harlan, the terminal not having been decided upon. Surveys have already been completed for the Indianola, Nevada and Winterset extensions, and franchises have been secured in the towns through which the lines will pass. Franchise ordinances have already been submitted to the authorities of the towns through which the Harlan extension will pass, with the expectation that they will be voted on at the city elections next spring. If the franchises are voted the surveyors will be placed in the field at once to find a practicable route. All the roads will be put in first-class condition. They will be standard gage, and will be laid with 70-lb. or 80-lb. rails. The company has prepared an issue of nearly $2,000,000 of bonds under the same trust deed recently recorded against the property of the Des Moines City Railway Company to provide funds for building the lines, and this amount will be available as fast as it is needed for the construction work.

WINTERSET, IA.—A special election on the proposition to vote a tax in favor of the Des Moines Southern Railway Company was held here Sept. 10, and the proposition was carried by a large majority.

THIBODEAUX, LA.—L. H. Lancaster, Dr. H. S. Smith, C. P. Young and Thomas A. Badeaux, who are interested in a plan to construct an electric railway between Houma and Thibodeaux, have been granted a ninety-nine-year franchise in Houma. The right comprises two routes, one over the Bayou Black Road and the other over the Terrebonne Road. The company has one year in which to begin building the road and three years to complete same. It is expected that conditions will warant the placing of contracts in November or December. About 130 miles of line will be constructed.

AUGUSTA, MAINE.—The Augusta, Hallowell & Gardiner Railroad Company has purchased the charter of the Augusta, Winthrop & Lewiston Railway, and it is announced that the road to Winthrop will be constructed and in operation by July 1, 1902.

AUGUSTA, MAINE.—The Railroad Commissioners have approved articles of association of the Augusta & Warren Railway. This road will practically be an extension of the line from Augusta to Togus, and it will extend from Togus, through Chelsea, Whitefield, Jefferson and Waldoboro, to Warren. This road will make a connection with the Georges Valley Railroad (steam), which runs from Warren, on line of the Maine Central Railroad, to Union. The length of the line will be about 27 miles. The capital stock of the company is $300,000, and the directors are: Governor John F. Hill, George E. Macomber, George W. Vickery, P. O. Vickery and Thomas J. Lynch.

SOUTH BERWICK, MAINE.—The South Berwick, Eliot & York Street Railway Company has been incorporated, with a capital stock of $80,000, to build an electric railway from South Berwick through Eliot and York. The line will be 20 miles in length. The directors of the company are: Hon. John F. Hill, H. M. Heath, C. R. Hall, Marcellus Shaw and George W. Vickery, of Augusta.

HOLYOKE, MASS.—The Ludlow & Holyoke Street Railway Company, which was recently organized, is rapidly perfecting its plans, and will shortly apply for incorporation. The company will be capitalized at $65,000. It will build an electric railway from the terminus of the Ludlow & Palmer Street Railway Company's tracks in Ludlow to the Holyoke Street Railway Company's tracks in Fairview, extending through Chicopee. The entire line will be 6½ miles long. It is said that power to operate the road will be secured from outside sources, the company not intending to erect a plant of its own.

WORCESTER, MASS.—The Worcester Consolidated Street Railway Company has placed orders for a new engine and generator that are to be installed in the power house to increase the capacity of the plant. The new engine will be provided by the Allis-Chalmers Company, of Milwaukee, and the generator will be supplied by the General Electric Company, of New York.

LOWELL, MASS.—The Lowell & Boston Street Railway Company, the new electric road which operates between Billerica, Burlington and Woburn, connecting with the Boston & Northern Street Railway and the Lexington & Boston Street Railway, thus forming a direct line to Boston, has been placed in operation.