

Street Railway Journal

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Proceedings of the Eighteenth Annual Convention

OF THE

AMERICAN STREET RAILWAY ASSOCIATION

HELD AT

Chicago, Ill., October 17-20, 1899

The eighteenth annual meeting of the American Street Railway Association was held at Tattersall's, Sixteenth and Dearborn Streets, Chicago, Ill., on Oct. 17-20, 1899.

President Charles S. Sergeant, of Boston, called the meeting to order at 11:20 A. M. on Tuesday, and introduced R. S. Taylor, City Attorney of Chicago, who, in behalf of the Mayor, extended the freedom of the city to the delegates in a short speech, in which he referred to the improvements which have been made in motive powers for street railways during the past ten years, and to the complex problems to be solved by street railway managers.

President Sergeant replied to Mr. Taylor's address in an appropriate manner, saying that he presumed that the association had never before had the freedom of so large a territory extended to it, and that he sincerely trusted that the members would not abuse the privileges accorded them.

The President: The next order of business is the calling of the roll. If it is the pleasure of the association, instead of taking time to call the roll, the official registration of the secretary will be deemed the calling of the roll. That has been the custom at the meetings for some time past, and will save us a great deal of time. I would inform the association that the executive committee has passed a vote that it considers that any American elevated railway company is eligible to membership in this association. We consider that the delegate of every member is a missionary at this meeting to bring in some other company, and the invitation is cordially extended at this time to all companies not members to join this association. We believe it will be for their good and ours, and we hope if there are any persons here representing companies not members of the association they will send in their application to the secretary.

The following companies then joined the association:

Pueblo Traction & Electric Company, Pueblo, Col.
Venice, Madison & Granite City Railway Company, St. Louis, Mo.
Atchison Railway, Light & Power Company, Atchison, Kan.

President Sergeant: The address of the president is next in order.

ADDRESS OF THE PRESIDENT

The American Street Railway Association—

Gentlemen: We are to-day assembled for the eighteenth annual gathering of our association, and for the second time we meet in this great and prosperous city.

I feel very deeply the honor which makes it my duty and pleasure to welcome you to Chicago in behalf of the street railway

men of this city, whose generous exertions have provided us with all the essential elements for a profitable and enjoyable meeting.

What remains to be done lies in your own hands, and I may be permitted to urge upon you the desirability of a full attendance upon the business meetings, and a free and ample discussion of the papers which will be presented. In order that the time may be sufficient for this purpose, your executive committee has purposely restricted the papers to a smaller number than usual, and earnestly solicits your co-operation in giving them full audience and ample discussion.

As will be seen by the report which is to be submitted, the financial condition of your association is good and improving from year to year, for which happy condition we should not forget we are indebted to the efficient efforts of your officers in prior years when the bank balance was not so readily visible; nor should the generous support of our exhibitions by our friends, the supply men, escape our notice.

The devotion of one day of your convention to the especial purpose of visiting the exhibits, which has been arranged by your executive committee, will be availed of it is hoped, by every delegate, to the mutual profit of all.

Those gentlemen who met here in Chicago in 1883, many of whom are, I trust, present to-day, could have had little conception of the changes in their business which were to occur before the end of this century. At that time there were in Chicago street railways operating about 153 miles of single track. At the present time the mileage of the surface street railways of this city is about 736 miles, of the Chicago interurban street railways about 261 miles, and of the elevated street railroads about 100 miles, either operated or under construction, making an increase since your last meeting here of 944 miles of track.

This remarkable extension of street railways, their equipment with mechanical motive power, the unique union "loop" system, and the successful application of electric power in the elevated railway service, are not only a wonderful testimonial to the courage, energy and capacity of their projectors, but they have made Chicago a street railway Mecca to which we all may come to observe and learn. We are, therefore, to be greatly congratulated upon the advantages afforded us by the selection of this city for our convention.

The year which has passed since we met has presented some unusual features which are worthy of our attention. The tendency toward consolidation of small or competing roads into larger homogeneous systems has been manifested by many examples. With the introduction of electric motive power the old time horse railway company operating a few miles of track on two or three city streets has disappeared, and its larger successor has found necessary such changes in administration, such extensions of its system and service, that the advantages of combination with rivals have become more and more manifest. The street railway which formerly gave a short distance urban service, has found itself extended far into the country; the same car which disputes the passage of a busy city street with a truculent teamster, may an hour later be flushing partridges and grouse along the rural highway, stopping to leave the tired artisan at his country home, and bringing a healthful excursion within reach of the humblest family—thus the trolley car is rapidly filling a long felt want which was neither

within the power nor the disposition of the great steam roads to supply. All this means changed conditions with new responsibilities and emphasizes the need of consolidation.

To successfully amalgamate such properties and organize and operate them with due economy and a just regard for the needs of the communities to be served, require of the operating officials a high degree of experience and skill. The new problems to be met offer better positions to which those who are ambitious may aspire, and the wonderful rapidity with which this situation has been developed will be a lasting monument to the officials of our American street railways. The advantages of this larger growth are many, and perhaps not the least is a growing respect for the value and importance of the street railway industry, which we may all hope will ere long be recognized by just laws, which shall deal fairly and equitably with the relations of the street railways to the municipalities, and give to capital invested in urban and suburban transportation security and a fair return upon the investment.

Another of the notable events of the year has been the failure of a striking attempt at municipal ownership, with which we are all familiar.

It is greatly to be regretted that the year has been signalized by several very serious strikes and attempted boycotts. With the consolidation of systems the question of labor assumes a greater importance. The paralysis of all the transportation of a large city is a grave public calamity to be prevented by all reasonable means in the power of the officers and men of the transportation companies, and by the municipal authorities. The larger the system of any corporation is, the more necessary it is that its management shall firmly and wisely conduct its affairs, and the more impossible that the responsibilities imposed upon the management should be delegated to others. Does it not, therefore, devolve upon us who are charged with such responsibilities, to take the greatest care that our representatives before the public, the employees, shall always receive such liberal and just treatment at the hands of all our officials that they may feel their interests and ours to be identical, and may loyally work with us for the good service of the public and our corporations? Care in the selection and instruction of employees may, therefore, well engage our constant attention. We are all merchants in that we have transportation to sell and must present it in an attractive manner if we wish to retain our customers.

The good will of the community which it serves, seems to be an essential element of success with any public transportation company, and the best means to obtain that good will should receive our careful consideration. In this direction lies, I believe, a field of work for our association and for each and every one of its members, which may be far more fruitful for good than our technical papers or our exhibits of apparatus.

We are all aware of the wide difference of opinion which exists in the community as to the proper relation of street railways to the public, the service they should render and the burdens they should bear, and last, but not least, the returns they should expect upon capital. In the press and in educational and social reform institutions, much prejudiced opinion and misinformation is promulgated calculated to injure public service corporations, and in so injuring them, to deprive them of much of their ability to adequately serve the public. Is it not our duty, each and all, in our own communities and wherever else opportunity offers, to take steps to remedy this state of affairs? Let us seize every opportunity to refute these current fallacies, meet the self-styled "economist" on his own ground and show him that his "quasi-public octopus" is the greatest public benefactor and social reformer the world has ever seen!

Fair minded men will generally listen to both sides of any question, and the ignorance of even those who should be well informed as to our industry, is so great that mission work to disseminate truth is imperatively demanded.

I believe that work of this character has already been undertaken by one of our friends of the Chicago daily press, and that in so doing he has set a worthy example which we may beneficially follow.

One of the saddest events of the year was the sudden death, in April last, of our lamented friend M. K. Bowen, president of the Chicago City Railway Company. Beloved by all who knew him, ever ready to spare his valuable time for the aid and information of others who sought to learn from his experience, he was an honor not only to the corporation he served so well, but to the profession which will miss him so sadly. Ever faithfully interested in your association, his untimely death brings a feeling of deep loss to us all.

I venture to remind you of the work which our friends of the Accountants' Association have undertaken and are accomplishing. The importance of accurate and uniform accounts to the success of any railroad can hardly be overestimated. A thorough knowledge of accounts and of finance are essential qualifications for the

administration of large properties. The work so far accomplished by their association, and their further deliberations, merit your earnest support, which will not only be beneficial to them but to each and all of the members of our association.

I wish here to express my appreciation of the cordial support and valuable work of your efficient secretary and executive committee. That our association may always be so fortunate is my earnest wish.

In conclusion, may I once more express my sincere appreciation of the honor which you conferred upon me by electing me to preside over this meeting, and bespeak your patience with my shortcomings. (Applause.)

The President: The next business in order is the report of the executive committee.

The Secretary: The report of the executive committee, as in past years, will consist of the reading of the minutes of the several meetings held during the year, which will show what has been done by your committee.

ABSTRACT OF MINUTES OF EXECUTIVE COMMITTEE MEETINGS

The first meeting of the executive committee was held at the Auditorium Annex, Feb. 6 and 7. There were present Messrs. Sergeant, Holmes, Lang, Yuille, Jones, Beggs, McCormack and Penington. The motion was made and carried that all members in arrears for dues for more than two years be served by the secretary with a written notice that if these back dues are not paid by Sept. 1, 1899, the executive committee will recommend to the association that such members be expelled in accordance with the provisions of Article XIX of the by-laws. The renewal of the treasurer's bond, issued by the American Surety Company, of New York, in the amount of \$5,000, renewed to Feb. 1, 1900, was presented to the committee by that officer, and placed in the possession of the president. The original bond of said company, dated Feb. 1, 1898, which had been in the possession of President Lang was delivered to President Sergeant. The salary of the secretary-treasurer was continued at \$1,500 per annum, as in the past years. The committee visited Tattersall's and approved the hall for exhibit and convention purposes.

The second meeting of the executive committee was held at the Auditorium Annex, Oct. 16 and 17. There were present Messrs. Sergeant, Moore, Woodruff, Lang, Jones, Beggs, McCormack and Penington. It was moved and seconded that the secretary write to all street railway companies eligible to membership which are not members of the association, inviting them to become members, in the belief that it will be to the mutual benefit of all concerned for them to belong to the association; also that in the sense of the executive committee any American elevated railway company is eligible for membership. The auditing committee, consisting of Messrs. Lang and Beggs, then rendered a report that they had examined the accounts of the treasurer and had found same correct. The report was accepted and the committee discharged.

Mr. Lang moved that inasmuch as the various technical papers, especially the street railway periodicals, devote considerable space each month to publishing legal decisions relating to street railways, that the publication of street railway decisions by the association be dispensed with. Motion carried.

President Sergeant read a letter from John T. Burnett, chairman of the special committee on the carrying of United States mail on street railways, in which he stated that the conditions during the year had not been opportune for effective work, and he believed that the committee should be continued for another year and given further time for action; or, if preferred, a new committee should be appointed. Mr. Lang moved that the executive committee recommend to the association that the committee on the carrying of United States mail on street railways be continued for another year. Motion carried.

Mr. Woodruff moved that the executive committee recommend to the convention the adoption of the following rules:

RULES OF THE CONVENTION

1. No member will be recognized by the president unless he shall announce distinctly his name and address.
2. Speeches will be limited to ten minutes unless the time shall be extended by the convention.
3. Members who desire to offer resolutions or other matters to be considered by the convention, are requested to submit them in writing, over their signatures, to the secretary.

Motion carried.

The minutes were approved and filed.

The President: We will now listen to the report of the secretary and treasurer.

REPORT OF THE SECRETARY AND TREASURER

| | |
|-----------------------------------|--------------------|
| Cash in bank, Aug. 25, 1898..... | \$3,656.28 |
| Receipts to Oct. 11, 1899 | |
| Membership fees..... | \$450.00 |
| Annual dues..... | 3,930.67 |
| Space, Exhibit Hall, 1898..... | 3,137.70 |
| Space, Exhibit Hall, 1899..... | 132.50 |
| | <u>7,650.87</u> |
| | \$11,307.15 |
| Expenses to Oct. 11, 1899 | |
| Printing and stationery..... | \$1,649.33 |
| Postage..... | 181.45 |
| Salaries..... | 1,500.00 |
| Executive committee, 1899..... | 383.12 |
| Miscellaneous expenses..... | 25.00 |
| Convention, 1898..... | 1,646.88 |
| Convention, 1899..... | 262.50 |
| | <u>5,648.28</u> |
| Cash in bank, Oct. 11, 1899..... | 5,658.87 |
| | <u>\$11,307.15</u> |
| Membership | |
| Aug. 25, 1898..... | 173 |
| New members to Oct. 11, 1899..... | 7 |
| | <u>180</u> |
| Withdrawn..... | 8 |
| Membership, Oct. 11, 1899..... | 172 |

NEW MEMBERS

- Aurora, Ill.—Aurora Street Railway Company.
- Bridgeton, N. J.—Bridgeton & Millville Traction Company.
- Chicago, Ill.—Chicago Electric Traction Company.
- Detroit, Mich.—Detroit & Pontiac Street Railway Company.
- Elgin, Ill.—Elgin City, Carpenterville & Aurora Railway Company.
- Joliet, Ill.—Joliet Railway Company.
- Montreal, Can.—Montreal Street Railway Company.
- Oakland, Cal.—Oakland Transit Company.
- Pasadena, Cal.—Los Angeles & Pasadena Electric Railway Company.
- Peoria, Ill.—Peoria & Pekin Terminal Railway Company.
- Schenectady, N. Y.—Schenectady Railway Company.
- Sioux City, Ia.—Sioux City Traction Company.

WITHDRAWN

- Brooklyn, N. Y.—Atlantic Avenue Railroad Company.
- Battle Creek, Mich.—Citizens Railway Company.
- Detroit, Mich.—Fort Wayne & Belle Isle Railway Company.
- New York City.—Second Avenue Railroad Company.
- New Haven, Conn.—New Haven Street Railway Company.
- Newark, N. J.—Newark & South Orange Railway Company.
- Sioux City, Ia.—Sioux City Traction Company.
- St. Louis, Mo.—People's Railway Company.

DUES UNPAID

| | |
|--|--------------|
| Derby, Conn.—Derby Street Railway Company..... | \$25 |
| Girardville, Pa.—Schuylkill Traction Company..... | 25 |
| Great Falls, Mon.—Great Falls Street Railway Company.... | 50 |
| Lansing, Mich.—Lansing City Electric Railway Company... | 25 |
| Lock Haven, Pa.—Lock Haven Traction Company..... | 50 |
| Newburyport, Mass.—Newburyport & Amesbury Street Rail- way Company..... | 75 |
| Oil City, Pa.—Oil City Street Railway Company..... | 50 |
| Portsmouth, Va.—Portsmouth Street Railway Company..... | 25 |
| Steeltown, Pa.—Middletown, Highspire & Steeltown Railway Company..... | 75 |
| St. Joseph, Mo.—St. Joseph Railway, Light, Heat & Power Company..... | 25 |
| Tampa, Fla.—Consumers' Electric Light, Street & Railroad Company..... | 25 |
| West Superior, Wis.—Superior Rapid Transit Railway Com- pany..... | 75 |
| | <u>\$525</u> |

1898 CONVENTION SPACE UNPAID

| | |
|------------------------------------|------|
| F. H. Newcomb, Brooklyn, N. Y..... | \$10 |
|------------------------------------|------|

DEATHS DURING THE YEAR

- M. K. Bowen, president Chicago City Railway Company, Chi-
cago, Ill., April 9, 1899.
- William Penn Cooper, superintendent, Thirteenth & Fifteenth
Street lines, Union Traction Company, Philadelphia, Pa., Feb. 23,
1899.

- John H. Callahan, secretary, United Traction Company, Pitts-
burgh, Pa., Feb. 13, 1899.
- DeWitt C. Cregier, ex-superintendent, Chicago, West Division
Railway Company, Chicago, Ill., Nov. 9, 1898.
- William E. Hale, treasurer, Toledo Traction Company, Toledo,
Ohio, Nov. 16, 1898.
- Joseph S. Lawrence, president, Charleston Consolidated Rail-
way, Gas & Electric Company, Charleston, S. C., Aug. 5, 1899.
- Charles F. Orthwein, vice-president Southern Electric Railroad
Company, St. Louis, Mo., Dec. 28, 1898.
- Austin Ely Smith, treasurer and general manager Springfield
Street Railway Company, Springfield, Mass., Aug. 8, 1899.
- Sylvanus M. Thomas, president and treasurer, Taunton Street
Railway Company, Taunton, Mass., Nov. 20, 1898.
- George Henry Wheeler, ex-president, Chicago City Railway
Company, Chicago, Ill., Aug. 11, 1899.

Mr. Wyman, New Orleans: I move that the report be accepted. Carried.

The President: There is at least one committee report, which will be presented at a later session. We now have the pleasure before us of listening to a paper by the Hon. Chas. T. Yerkes, entitled "Investments in Street Railways: How Can They Be Made Secure and Remunerative?" [This paper appears elsewhere in this issue.]

Mr. McLean, Toledo: I move that the thanks of the association be extended to Mr. Yerkes for his able and interesting paper, and that it be entered in full on the minutes of this meeting.

The motion was unanimously carried.

The President: Personally I wish to thank Mr. Yerkes also for the very able paper he has given us and for explaining his methods of getting at the real essence of the whole financial situation of the operation of street railways, based upon his experience, as they have been developed in this paper. I am sure it will be a most valuable lesson to us all. The paper is now open for discussion. I will call upon C. D. Wyman, of New Orleans, to open the discussion.

Mr. Wyman, New Orleans: I think that by the vote you have passed, in which I most heartily join, we have expressed our sentiments touching this paper most sincerely; I felt when I saw such a topic had been assigned by the committee having that matter in charge for presentation at this time, that it was a topic which was of the greatest importance, and which we might congratulate ourselves would be presented at this meeting, but especially did I join with you in that pleasure which I know you all experienced when it was announced that Mr. Yerkes would read a paper upon that topic—a gentleman who has been so thorough a student of street railway enterprise, both from the financial and operating side. It seems to me also a work of supererogation on my part to attempt to add anything to what he has said upon this subject. But I will venture to say a word or two upon some lines which may possibly touch us as managers in our relation to our stockholders, our investors, that we have all duly considered, and yet which might be proper to suggest in connection with the lines of thought that Mr. Yerkes has presented.

Of the importance of sustaining and preserving the confidence and the faith of investors in the enterprises in which we are engaged there can be no question. When it is remembered that one-third of the invested wealth in civilized nations is to-day placed in steam and street railroads, and not an inconsiderable portion of that investment is in the street railroads, that we should secure and hold the confidence of our investors and that we should make their investments profitable is very evident. The great search which now is manifest on the part of capitalists to put their money into street railroad enterprises is one which should be met by a corresponding effort on our part to make everything plain, clear and distinct to them in regard to such

enterprise. In choosing a board of directors from among our stockholders it is always customary, of course, to select men not only of financial responsibility in a community, but we always regard it as necessary and proper to select men of high probity of reputation and of position. And if upon the officials of the company, the managers and the directorate, there is made emphatic in the eyes of the public this feeling of responsibility to the public and also the equal responsibility to their investors and the capitalists, the impression is wise and beneficial, and tends, moreover, to the extension and expansion of our business; for I take it in this respect, at least, we are all expansionists.

I remember reading in the paper that a distinguished orator here in Chicago, upon the occasion of a great gathering recently that was discussing trusts, said that in his opinion any danger on the part of aggregated capital might be warded off if there was a sufficient amount of publicity given. There is one thing that I respectfully submit to you in this matter, as my belief along this line, and that is that we should be frank, free and open with our investors; that we tell by means of circulars, of statements, of various methods of publication, of our operations and results, and state the truth, the exact truth as near as we can ascertain it, to all those interested in our respective companies, whether they be interested to a large or small extent.

While it is possibly true that complete disclosure at all times of the policy of the company might thwart it unjustly and unreasonably, I still do hold to this idea, and I am very glad to see, by publications made recently, much more so than a few years ago, that the results of our work are being set forth constantly and freely, and I believe that the more this is done in a proper and complete manner the more we shall secure and retain the confidence of our investors and secure likewise their further investment with us.

We often have what are known as "panics," a sort of neuralgia that pervades the financial market, and the usual reason given to us (we, perhaps, are not so thoroughly skilled in such matters) is that it springs from a want of confidence, that actual values are not disturbed, speculative values are, but that it results from a want of confidence, a fear, a distress, an uncertainty as to what is going on. Credits are withdrawn.

We may to some extent ward off any such feeling, any disquietude on the part of our investors, by letting them know the facts so far as we are able to do it, and give them frankly and freely our judgment as to our present condition, and our anticipations of the future with reference to the enterprises with which we are connected. I also believe we should adopt, so far as possible, a plain, simple and thoroughly understandable method of bookkeeping, and I am therefore most heartily in accord with the Accountants' Association now in session, who are endeavoring to do precisely that which I am endeavoring to describe. The average stockholder oftentimes becomes very much muddled when he attempts to study out the question of what shall be charged to operating expenses and what to permanent betterments, and, therefore, to invested capital. So far as it is possible, such a system of bookkeeping and recording of expenses should be adopted as will make everything clear and thoroughly comprehensible to his mind. I would also suggest in this connection the question of depreciation and the providing for same. I am exceedingly glad to see that some of the railroads, and notably the Milwaukee Street Railway Company—presided over by so able a manager as Mr. Beggs—have taken up this question of depreciation very carefully, very particularly, and have taken into account the depreciation of the different mechanical parts entering into the physical equipments of the roads. They are setting aside

annually, as I understand it, a certain amount of money from their receipts to make good that depreciation.

Many electric railroads, or for that matter, cable railroads, recently converted from horse lines, are liable to lose sight of this fact for the first few years of their operation. Their receipts naturally increase and their expenses may be at a very low ebb, by virtue of the fact that everything they have is new and the era of repairs has not set in. It seems to me, therefore, that it is unsafe from the results of that particular year, or some other year, to predicate what the earning power of the company is going to be, or to tell stockholders that these results may be always expected. While it is always to be hoped, of course, that the increase of receipts will take care of the repairs and depreciations, it is, nevertheless, desirable if we can make certain and absolute that point by studying out what this depreciation is, what this life of the equipment is going to be, and we are at least on the safe side if we begin to provide for it, and tell our investors that that is what we are doing from the initial roll of the first wheel on our line. I think this subject is very important. The average net receipts for the years as they pass should be made up on such basis, and in that statement of average net receipts should come a careful estimate of the amount of money necessary to replace the rolling stock, power-house and miscellaneous equipment, after its life shall have been exhausted, and then a certain amount should be set aside; it may be very certainly fixed,

It is now some years since electricity, or that form of motive power which the major portions of the roads are now using, has been in our hands, and it is therefore by no means a difficult matter to come within a very fair average of the life of these different mechanical appliances and devices, and the material which we use in our different operations. Some time, possibly, we may be put under pressure to hasten matters, but I think a conscientious, firm, truthful, frank and honest management, while it may be criticised as being too conservative, had better err upon that side rather than the other. (Applause.)

Mr. Beggs, of Milwaukee: I feel very deeply interested in this subject that has been so ably presented here by a gentleman who has spent almost a lifetime in the ownership and direction of street railway affairs, and I feel so deeply interested in it because I am in a condition similar to that stated by Mr. Yerkes. I am charged with the responsibility of managing what is becoming one of the larger street railway systems of the country, but I am more than that, and have, therefore, given to this matter the most close and careful thought, because I can say, with Mr. Yerkes, that all I have in the world is in street railway property.

I think there is a side to this question that has not been touched upon in Mr. Yerkes' paper, even so thoroughly as he has discussed it, or in Mr. Wyman's analysis of it, and I desire to throw out that thought here. It is one which, as my friend, Mr. Wyman, has suggested, the Milwaukee company has taken hold of. I want to know that when I have been laid to rest, those to whom I may leave the results of a life of hard work will have some protection for the payment of these securities when these short-term franchises have ceased to exist. Taking the property of which I am now speaking, the franchises have a little over twenty years to run, and yet we are discussing the question now, as they are in some other sections of the country. We are trying in advance to make calculations as to how much we are justified in putting into that property and how long we have in which to get a return from it. I do not know that it is being done so methodically by other companies—it may be. We have calculated, and I believe you will recognize that this is a proper charge against earnings,

that you have a right to set aside a sum for this purpose before the public can demand that you shall give greater accommodation for the carrying of a passenger 12 miles to 15 miles, to which Mr. Yerkes has alluded, or that the fare shall be reduced. We are setting aside a certain amount for this purpose, to be paid to those who may succeed us in our investment in these properties, and so that, after the twenty years expire, they will not simply have turned over to them, out of which to recoup their investment, a pile of junk on the streets, that the city wants to return in order that it may make a better dicker with some one else. I feel that we have a good investment in the property if properly run. When a road is new and the equipment requires very few repairs it is not usual to look forward to the time when 45-lb. rails must be taken out and replaced with 80-lb. or 90-lb. rails, nor to the time when we shall be taking off the single-truck cars, the cost of which is \$2,900 each, and replacing them with cars costing almost four times as much. The thought which I wish particularly to present here is that we must make some provision for the time that these bonds of ours will mature. In the case of the Milwaukee property, this does not occur until two years after the expiration of the franchise.

Now, as to the other point suggested, the security. Because I do not want to have anything to do with a thing that I cannot put my own means in, I want to know what provision has been made to pay these bonds. Is there any sinking fund being set aside by your companies to take care of these various investments when they shall mature? Gentlemen, you must make proper provision for your properties by looking forward a very few years, when they will have to be thoroughly reconstructed from the ground up. I estimate that we replace 10 miles of track every year, and that is not at all conservative, because we have about 150 miles of track in the city limits, and I estimate that it will last fifteen years, which no track has done thus far. We must, therefore, put down 10 miles per annum to make it good. We estimate our rolling stock in the same way. It is a wonderful thing to tell, not only to the specialist, but to any business man or to any court, and it was very influential in the argument where the city tried to make us give 4-cent fares, that with proper maintenance of our system we could not do it. If we had taken the figures as they appeared on their face, our earnings would have seemed to be sufficient to warrant a reduction in fare, but they were fictitious, they did not represent our normal repair condition as it was. I desire, gentlemen, to impress upon you the necessity, in order to make these securities safe, of having the public take them as they do our water-works and gas stocks, in nearly all of which the charters are perpetual. The longer our franchises have to run the more we can afford to spend upon the betterment of our systems and the greater the facilities we can give. We are merely merchants, as Mr. Yerkes stated, in selling transportation, and we must make a practice of "provoking the public to ride." It seems necessary in order to give security to these investments to make some provision for the bonds when our franchises have expired, and when we cannot earn the interest on them, to say nothing of paying the principal.

The President: We should like to hear from Mr. H. H. Vreeland, of New York, on this subject.

Mr. Vreeland: I had hoped that our president could have waited until a little later before calling upon me, because it is placing me in rather an embarrassing position, calling upon a boy to talk in the presence of a lot of men. I am but a child in street railroad work, and it seems that anything that I might say in the way of analysis of the very valuable paper of my friend, Mr. Yerkes, would be criticising the pioneer and the patriarch in street railroad work.

I have learned since my connection with the industry that of the few men who started their life's work in connection with street railway interests, who have invested their money as they made it in the interests which they had created, who have followed it up as a life work until it reached a success far beyond what was considered possible for men to attain in any line or calling years ago, Mr. Yerkes is really the pioneer in that direction.

There is a thought in connection with Mr. Yerkes' paper that occurred to me when he suggested the question of management, the consideration not only of the average revenues, but the average of expenditures; that is one of the very strong points that appeals to the confidence of investors and the general public in properties. The great steam railroads of this country, with which the greater part of my life has been spent—you have only to mention the Pennsylvania, the New York Central, the New York, New Haven & Hartford and roads of that class to know what I mean—have created a confidence in the permanency of their managements. Secure the proper man to manage the property. This is really more important in street than in steam railroading, from the fact that in the steam road the directors do direct. There is not very much done in street railways in that direction. The manager is elected and put to work and allowed to run the property. He does not get much help, and he has to be a man who can meet the local municipal conditions, the State conditions and the general conditions as affecting the properties so far as legislative and municipal affairs are concerned. He has to be a man who can take care of the financial part of the operating side, and he has to do it with very little assistance.

The next thought that occurred to me was what my friend, Mr. Wyman, suggests, and it is a very important one—the question of publicity. Coming out of the school where we are taught—were taught for years—not to submit a report to your directors or president without analyzing it thoroughly, not simply showing that their train tonnage increased so much, mileage increased so much, revenue decreased so much, but went to work and analyzed it, and the same with reference to passengers—coming from that school then, I was surprised to find how very little of that there was connected with the street railroad system. In many cases, in the early days, there were good reasons for this, because usually two or three men ran the railroad and for years would act in the same manner as they would with a country store, and divided the money in the drawer among themselves. But the effect of consolidation and merging of the railroad interest in this country, both of steam and of street railroads, where 946 properties have been consolidated within the last ten years, irrespective of what may be termed trusts or monopolies, have changed this. The consolidations have reached a point where, by reason of recapitalization and reissuing of bonds necessary, our securities have come into the hands of the investing public, and the managers are the care-takers of the property, not of the few, but of the many. But it is necessary to let people know what they are buying and what values they are getting to determine whether it shall be made into a fund or be a different proposition. The number of the stockholders in the large corporations, I am glad to say, is increasing very rapidly in the different properties with which I am connected. The increase in the average number of stockholders has been very large. In the Metropolitan Street Railway Company the increase has been over 150 per cent in the last ten or fifteen years, both in the increase of capitalization and the bringing in of new investors. At the present dividend we had 130 more stockholders than we had at the last dividend three months ago; not one of them held over 100 shares of stock, and they are residents of New York City. That is one of the greatest

elements of strength in the handling of this property where we have to meet with the municipal and State question—a common interest with citizens in our properties—are located in the properties themselves. It assists and helps out with the question, gains friends for the property and assists very materially in the management.

With the question of twenty-year franchises and twenty-five-year franchises, I am glad to say that many years ago my predecessors were granted permanent franchises. Lately (though after we had secured such permanent franchises as are necessary for the handling of the business for the territory where we operate), the State Legislature decided to limit all future franchises to twenty-five years, so that it is not a question for me, as manager of the property, seriously to consider, but it is a very serious question for the other fellows.

There is one further point that Mr. Yerkes suggested, and that is the labor question. It is the life of the street railroad. All other matters connected with the property are insignificant. The financial side, the transportation side, except as represented by labor, are insignificant as compared with the great problem of handling labor. In the large consolidations there are, say fifteen or twenty different lines in which the employees have been handled under the theory and ideas of as many different managers, and you see how difficult it is to bring that body together, to try to get them responsible to one man and responsive to one method of management. It is a thing that requires a great deal of energy and ability, but it is a thing which, if once accomplished, gives the public to understand that the manager is managing the labor problem and not the agitator. And if you can get that confidence you must adopt the same policy as the agitator and take the platform as he does when he talks in his interests, and make up your mind that it is just as important for the manager to go on that platform and talk to them in his interests; that is one of the greatest elements of strength in the street railway question in my mind. I feel that it is one of the things to do in consolidating properties, and that the success that has come to our property is largely attributable to this. The success of the investment is in the confidence of the stockholders and the general public that no crisis is going to confront the property this year or next, that may not only wipe out the dividend, but mean the elimination of the entire earning capacity for that period and the disturbance of all the smooth working conditions that are necessary at all times.

Mr. McLean, Toledo: I feel amply repaid for attending this convention and listening to the discussion already had upon the very able paper of Mr. Yerkes, and without taking up the time of the convention, I think it proper to say that the paper itself and the discussion had upon it open up a train of thought which we can carry home with us, and which will inure to the benefit of the properties with which we are all identified. (Applause.)

Mr. Foster, Lynn: I feel entirely unequal to expressing to you my opinion upon this subject, although I have listened with a great deal of interest to the very able paper read before the members of the association by Mr. Yerkes, and I have also been interested in the very able discussion of the gentlemen who have preceded me. I agree with them that it is a subject of very great importance; but it appears to me to be a subject of far more importance to those operating street railways in the Western countries than it may be possibly in Massachusetts. In Massachusetts we have a Board of Railroad Commissioners, who have supervision of the movements of the street railways. Our tenure of franchise is entirely different, as I understand it, from what it is in this section of the country. There a franchise is granted to a corporation without lim-

itation. To be sure, it is subject to revocation by the local boards, approved by the railroad commissioners. Of course, it would seem absurd on the part of the Board of Railroad Commissioners to revoke a charter on which they had approved the issuing of securities. Their approval is set upon the securities as a seal, and they have the power of limitation on the amount of securities which are issued, or may be issued. I understand that not to be the case in the Western States. It would seem that you are justified in seeking some better protection than what you now enjoy. I do not say, gentlemen, that the laws of the State of Massachusetts are superior for the operation of street railways than those of any other States, but I do feel that the investors are protected. It is frequently remarked by those offering securities of the home companies in Massachusetts that it is a dividend paying stock and it is free from taxation, making it a very desirable investment. A person holding street railway stock in any of the home companies, I believe to have a security which will justify any one in investing in it on account of its permanence. To be sure, we are subject to the caprice and whims of the local authorities to a certain extent, but that is limited by reason of our right of appeal to the Board of Railroad Commissioners.

Mr. Yerkes, Chicago: May I be permitted to ask the gentleman a question on one point he made? I understood from him that the grants of street railroads are liable to revocation at the instance of the local authorities, confirmed by the commissioner. Is it not a fact—and this I merely ask for information—that the courts have decided that these revocations cannot be put into effect unless it can be shown that the roads are not needed by the people? That was the point I wanted to make. According to your argument, Mr. Foster, it would seem as though at any time the municipal authorities and the commissioners could get their heads together, and could compel all the tracks in any town in Massachusetts to be taken up.

Mr. Foster: They would have to show that public necessity and convenience required the removal of the tracks; otherwise they could not do it.

Mr. Yerkes: It would be a pretty difficult thing to get the tracks up after the people once became accustomed to the use of the cars.

Mr. Foster: I do not know of its ever having taken place, except in one instance. I think there was a leased road where they undertook a revocation of the location; it was revoked and another was substituted for it. It was not a complete revocation.

The President: We do not want to hear from one section of the country alone. I may, perhaps, recognize the face of some gentleman because he lives in New England; I think we want to hear from all parts of the country. The South is represented here, and I believe we would be glad to hear from F. G. Jones, of Memphis, and other gentleman from the South.

Mr. Jones, Memphis: I think everything has been said that would be of any benefit, so far as my ideas go. We certainly have gathered very considerable information for us all in the line of making investments productive to people looking for that sort of securities. I do not believe it will be possible for me to add anything that would be interesting on the subject. We have certainly gathered some points and ideas that are new to us on the line of these short franchises, from our friend from New York, who gives us a pretty good idea that some of the larger companies there have gone in and succeeded in getting perpetual franchises. These arguments are going to help us in our territory when we come to ask for further extensions, and that, among other things, has been very gratifying to me. (Applause.)

The President: I see in the rear of the room a gentleman from whom we ought to hear, N. H. Heft, of Meriden, Conn. I am sure he has had a large experience in steam railroads, and possibly he can give us some idea on this question.

Mr. Heft, Meriden: While my time has been given to the building of electric railroads, I have not been required to direct any of my energies toward raising the money to pay for them. Our board of directors has done that. I have simply directed my energies to seeing how I could best spend the money to make the investment more desirable, and while I believe it is necessary to sustain harmonious relations with municipalities and with the State Legislatures, and with the public in general, I believe that the greatest benefits will come to the street railroad through mechanical and electrical engineers in improving the present equipment of the road. I believe that sufficient attention has not been paid to this matter, and in a great many instances we have run mad on the question of rails and the question of car equipments. In going over the questions of weights to-day I was horrified to find that for every paying passenger hauled with the modern street railway equipment we were drawing 721 lbs. of dead weight, exceeded by the steam railroads only to the extent of 137 lbs. with their standard steam railroad equipment. I think it behooves all street railroad managers to turn their attention to the question of equipment, to see if they cannot get rid of some of this weight. We expect to operate within the next two months a car whose weight, including the entire equipment, will not exceed 227 lbs. per passenger.

I have been very much gratified in listening to the paper of Mr. Yerkes, and also much interested in what our friend Mr. Wyman has said. He is always good, and I have also listened with a great deal of pleasure to our friend Vreeland, of New York.

The convention then adjourned until 10 o'clock Wednesday morning.

WEDNESDAY'S SESSION

President Sergeant called the meeting to order at 10:10 A. M.

Secretary Penington then read an invitation to the delegates from the Siemens & Halske Company to visit its plant. The secretary also announced that the excursion to the drainage canal would take place in the afternoon, and that the special train would leave the Dearborn Street station at 1:30 o'clock. The secretary also stated that as there was nothing on the programme for the evening, it had been arranged that the ladies should meet and go to the exhibition hall in a body to view the exhibits.

The President: The first paper upon our programme for to-day is a paper entitled "Maintenance of Car Equipment," by J. H. Vander Veer, superintendent of motive equipment, Brooklyn Heights Railroad Company, Brooklyn, N. Y. [This paper is published elsewhere in this issue.]

The President: The thanks of the association are due to Mr. Vander Veer for his able paper. I trust that it will be very fully discussed by all the practical and unpractical men who are here, but I do not think there are many unpractical ones. I desire to call on some one to open this discussion, and I will ask E. G. Connette, of Nashville, Tenn., to do so.

Mr. Connette, of Nashville: My primary education in the railway business, having been with steam railroad systems, has probably diverted my mind in a different direction from the opinions of some street railway people in regard to the inspection and maintenance of street car equipments. You all know that after a locomotive makes one trip, perhaps, of 100 miles or 150 miles, possibly 200 miles, it enters the round-house and is inspected, cleaned

and all necessary repairs are made before it makes its next trip. So on the line with which I am connected. I adopted the method that when a car comes in from its work at night, having run perhaps 100 miles to 150 miles, it is first cleaned, then inspected. All the parts of the motor, including the wire connections, the brush contacts, and all the parts of the truck, are properly inspected, loose parts tightened up and all minor repairs made to the car, and it is prepared then for its journey on the following day. My experience with that method for perhaps ten years justifies me in saying that it has been entirely satisfactory. It is argued by some that daylight inspection is better, because the men have a better opportunity to see what they are doing, and feel more like working in the daylight than they do at night. That is true to a certain extent, but with a limited car equipment, and, perhaps, with the car-houses located in such a manner that it would be inconvenient to have the cars run in during the day from time to time to have the inspection, cleaning and repairs made, it becomes necessary with some companies to do the work at night. To a large extent this is the case with the system in Nashville, but, as I stated, the system of cleaning, inspecting and making minor repairs at night has been very satisfactory. If a car goes out in the morning and something occurs to disable it and it is brought into the shed, and it is found that the defect was caused by a lack of inspection, proper action, of course, is taken. That is an incentive to the night inspectors to do their work properly, because if they do not do it, results will tell. The general overhauling is done by the regular repair force by daylight, and we make it a rule to have the motors generally overhauled perhaps once in six months. About two years ago we had a very large exposition in Nashville, the Centennial Exposition, in commemoration of the one hundredth anniversary of the admission of Tennessee into the Union. During that period we hauled a very large number of people, using trail cars behind every motor car, with a headway of from one minute to 1½ minutes regularly, and during the six months of the Exposition there were but six motors disabled. I think that record will justify me in stating that the application of steam railway methods to street railway service has been entirely satisfactory to our company.

W. E. Harrington, of Camden, N. J.: I represent the Camden road, on which we operate at this time about forty-three cars, and do the bulk of our inspection and minor repairs at night. We do the general repairs, the carpenter work and painting work on the piece-work system, which has proven very satisfactory to us. One of the difficulties in adopting the piece-work system was in establishing prices for the work, not having any precedent, and we struck upon a method of covering possible mistakes in prices by limiting the amount of bonus that we would give in this way: If we set a contract price for a piece of work, say \$5, and the work was actually done for \$2, that would make a profit of \$3, which would be entirely disproportionate; so we settled on a limitation of 20 per cent of the actual cost. If the work cost \$2 and the contract price is \$5, the actual bonus would be 40 cents; whereas, if the cost exceeded \$5, the loss would not exceed 20 per cent of the actual cost price. That seemed to satisfy the shop-men, and enabled us to settle quickly this question, and it has been very satisfactory in its operation. We followed this same practice in our construction work, as well as the repair work, and in every respect it has been very satisfactory.

The matter of car cleaning and washing with us is a very serious matter, on account of the great amount of dirt and dust which we have in the territory through which our cars run. We do our car washing at night, and do that also on

the piece-work system. We are washing 18-ft. bodies for 15 cents a car, sweeping them out, dusting them and washing them thoroughly, and double-truck cars for 22 cents. The cost formerly was 40 cents to 60 cents for the same cars. We have got the cost down to these very low figures, and the work is being satisfactorily done. A point upon which I would like to get information is what is the general experience of the members in reference to the number of cars that are housed for repairs, taking the percentage of cars housed for repairs in proportion to the total number in operation. On our road the average is 10 per cent of the number of cars in operation, which are sent to the shops for repairs. I think this point should be brought out thoroughly, as it is a guide to know how many equipments to provide, and I think it is a point which should be generally discussed.

Mr. Vander Veer: In regard to the allowance of 10 per cent as the number of cars housed for repairs, we find on the system in Brooklyn that on some lines it will average 10 per cent, but on others it will go as low as 4 per cent, depending a great deal on the service and the equipment we have at the particular depot. I think 10 per cent of the total number of cars is an extreme limit.

Mr. Harrington: What effect would the question of having single-motor equipments and double-motor equipments on any ordinary road have on that percentage? We are running single-motor equipments, and I know that our depreciation is relatively high on our armatures and motor parts, and I ascribe a great deal of the percentage stated to be due to that fact. What is your experience in that matter?

Mr. Vander Veer: I have fortunately had nothing to do with single-motor equipments during the last few years, but my recollection is that it is much higher than the percentage stated. It will run higher than 10 per cent for single-motor equipments. Of course, the miles run per day and the style of motor will have a great deal to do with the question.

E. C. Foster, of Lynn: I would ask the gentleman if he considers there is any economy in operating a single-motor on an ordinary car? As I understand the situation now, this gentleman has been speaking of disabled cars which are lying in the car-house during a part of the day, and this disability, as I understand it, is due to defective apparatus. He says that 10 per cent of the cars are in the house all of the time. It seems to me if that is a fact we should go into the subject further, and ascertain if there is any profit in running single-motor cars. I would say for the benefit of the association that our experience on a suburban and interurban road is that we have not found it profitable to operate single-motor cars, probably on account of the increased expenses incurred in the maintenance of them as compared with the double-motor cars. This past season we have been operating one ten-bench open car with a pair of G. E.-57 motors, each having a capacity of 52 h.p., making the two motors 104 h.p. That, you will recognize, is an excessive amount of power to operate a ten-bench, single-truck car. But the results, so far as repairs have been concerned, have been very satisfactory, no repairs being required on that car during the entire summer. We have not even worn out one pair of brushes, although the car has made about 120 miles a day. I believe it has been customary in the past to operate a motor of small capacity, and by reason of that small capacity the expenses of maintenance have been increased very materially. There is only one other matter I would refer to, and that is if the gentleman has any figures as to the cost of painting or varnishing the cars, cleaning up and touching up the cars, I would like to get the figures for the labor.

Mr. Harrington: In reference to the first matter, the greater depreciation in using single-motor equipments, we have been using single-motor equipments practically up to date, with the exception of a few double-truck cars recently purchased. About one year ago we equipped one 18-ft. body with double equipments, and where we averaged a car in the house, say once in every ten days, with the single-motor equipment, that car has only been in the house three times in a year, and that for only petty repairs. On the strength of the record of that car, our board of directors has concluded to order double equipment for twelve of our cars as a starter. Our armature depreciation has been, in my judgment, tremendous and altogether out of reason. On a forty-car road we have one armature man busy all the time doing nothing else but looking after the armatures, and I think we will be able to put him on some other work in conjunction with the armature work as soon as we have more of these double equipments. Just the exact cost of depreciation on single equipments it is difficult to say, but we are sure we will cut it down with the double equipment.

In reference to the cost of painting, while I have not definite figures in my mind, I can give you a general run of the work. The contract price for taking the car into the house, burning the paint off, painting and varnishing the car on the outside throughout, and varnishing the inside, is \$20. For ordinary touching up and varnishing outside, with paint already on, and one coat of varnish on the inside, the contract price for an 18-ft. car is \$6. The cost of material is approximately the same as the labor.

Mr. Foster: Do you do the work by the week or by the hour?

Mr. Harrington: We pay the painters \$2.50 and carpenters \$2 a day for that class of work.

Mr. Reed, of Salt Lake City: How many coats of varnish do you contract to receive when the cars are re-varnished?

Mr. Harrington: Our contract covers putting on the first coat and the rough stuff, rubbing down, putting on the second coat and rubbing that down, and putting on three coats of varnish afterward. There are really five distinct steps in the operation.

Mr. Connette: There is one element of saving in running single motors where they can be conveniently run, and that is in regard to the power used. In Nashville, Tenn., there is very little level ground; it is up hill and down hill everywhere. I tried an experiment in the running of a single motor, and found by test that it used about 35 per cent less power than with double equipments, but we could not use the single motor for lack of traction. Most of our roads have no loops at the end, and consequently the ends of the car are reversed, and when the motor was in front there were many places where it was quite difficult to get up with a single motor, on account of the lack of traction. When the motor was on the rear axle, of course that difficulty was not so great, but there is a saving in power by the use of a single motor. It strikes me that where single motors are used that fact would, to a large extent, limit the capacity of the car, or the size of the car, in proportion to the power of the motor used.

In Louisville, Ky., where they operate possibly 200 or 300 cars, it has been my observation that nearly all of them are run with one motor only. One S. R. G. motor is employed, but their cars are small, most of them having been old horse cars converted into electric cars, and the city being comparatively level, I understand they operate very satisfactorily.

Mr. Douglass, of Cleveland: It seems to me that this question of single and double-motor truck cars depends a good deal on the condition of the track. I represent the

"Big Consolidated" road of Cleveland, where we recently have had a little disturbance, and we have some bad track, as do most other cities. We have some old Johnson rail on chairs, and all that kind of thing, and have recently purchased 150 double-truck cars, modern cars in every respect. One motive in getting these cars was to keep up with the times and handle our people in the best way. Another reason was that we have some bad track, and by putting the double-truck cars on this track the cars would run smoothly over the track, which was almost impossible with the single-truck cars. The relative advantages of single and double-truck cars is a question of track to a great extent. I think single-truck cars of from 18 ft. to 24 ft. in length can be operated more easily and simply than double-truck cars, and I do not think we should discard the use of such cars if our track is in good condition. It strikes me that the question of the track is largely a factor in this matter.

When I went to the "Big Consolidated" Road on May 1, I found that contracts for the painting of the cars were in force there, and they were unsatisfactory. The company was paying 25 per cent more for painting, touching up, burning off and varnishing, as the different requirements called for, than it actually costs now by days' work, and we are getting fully as good work. Under the contract system, the men painted the window glass and daubed things generally. We get much more satisfactory work by the day, and I think we save 25 per cent. That will apply to painting and varnishing.

We have a contract for making armature coils and doing similar kinds of work, which is extremely satisfactorily. We have that contract still in force, and that is the only contract work we do. I have not seen fit to change that method of caring for this work.

Now, about trolley wheels. When I went to the Brooklyn Heights Road about five years ago, Mr. Vander Veer was there, but I did not have the pleasure of making his acquaintance. They were manufacturing their trolley wheels out of zinc, brass and copper. I have often wondered since why we did not put in a brass foundry to make the trolley wheels. We are buying castings in the rough, and turning them down half way and putting in the bushings. I wonder why we do not make these castings ourselves and scrap our old copper and brass at 15 cents a pound before paying such large prices for new wheels. I believe, however, that the Brooklyn Heights Company has discontinued that practice. I would be glad to hear Mr. Vander Veer's experience on that line.

Mr. Vander Veer: With regard to the brass foundry, while it commends itself to a large road, our experience was that our men made things out of brass that should have been made out of iron, and we shut down the foundry for a while. We started it up again a short time ago.

Mr. Douglass: Is it not economy to make your own wheels on a road of your size?

Mr. Vander Veer: Yes; it is profitable.

Mr. Douglass: A saving of 25 per cent to 30 per cent?

Mr. Vander Veer: Yes, fully that; but there is always a tendency to drift off into other things.

Mr. Douglass: I am surprised that more of us do not make our trolley wheels.

Mr. Beggs, of Milwaukee: The question of Mr. Douglass brings out many other points as to the cost of operating a road, and the question whether roads could profitably manufacture trolley wheels, like many other things in use on the road, would depend on what they are compelled to pay for them. I have a contract for trolley wheels at the present time, made according to a formula which on our lines seems to be the most advantageous, as to the proper degree of hardness of trolley wheels to give

best results without wearing the wire, as we consider it preferable to wear the wheel, at 23 cents per pound; we have also a contract for converting the worn-out trolley wheels into new ones. I do not believe that any road can afford to put in a brass foundry and make its own trolley wheels if it can buy them at that price. We can get 16 cents for the old wheels.

Mr. Douglass: Is the price quoted the rough casting?

Mr. Beggs: That is the finished wheel; a wheel 5 ins. in diameter, which is somewhat larger than the wheels on many other lines. We believe in large wheels, because they run at less speed. Our trolley wheels weigh approximately nearly $3\frac{1}{2}$ lbs. finished, and including the bushing, and I do not believe there is any road that can maintain a brass foundry profitably when it can buy wheels at that price. The argument so often made by municipalities that they can operate street railways and electric light plants and other public utilities at less than we, who are in the business, can, applies here. Many times the special foundries in connection with your road are not charged off where they should be charged; that has often been the case with the brass foundries and other appliances run in connection with a road, nothing is charged off for superintendence, for percentage of capital represented, and everything of that kind. When it touches that particular point I do not believe that any road which is in a position to make a proper contract for trolley wheels can begin to make them as advantageously as some manufacturer who has other things to make in connection with the trolley wheels. It depends very largely upon the contract price which the road is able to make for trolley wheels. In view of the increase in cost of material during the last twelve or fifteen months, I am paying now about 30 per cent more for trolley wheels than under a contract made eighteen months ago. In order to get a satisfactory price I made a contract for 5000 wheels to be delivered to us at the convenience of the shop turning them out, made according to our formula and pattern, and they can turn them out in between times in their shop. I know that I could not run a brass foundry and begin to turn these wheels out for what they cost us to-day under a 5000-wheel contract.

I would like to throw out a suggestion here, Mr. President, in connection with this matter of motors, particularly as my friend Douglass has just made a contract for a large number of double-truck cars. I would like to give him the benefit of our experience at Milwaukee in connection with the number of motors. I do not believe any road can judiciously run single motors. I have not believed so for the past ten years. The 35 per cent of power saved, which has been referred to here, I think is three-fold paid for in greater cost of repairs to single motors and other portions of the car. I think the cheapest thing virtually that we put on an electric railroad is the power that moves the car; it costs less than almost anything else going into the car. Three and a half years ago we adopted a standard car on our lines—a double-truck car. We have steadily advanced upon that plan and improved that equipment, until we put on twenty-five cars this year, and we will put on about thirty-five new cars annually in order to keep up our equipment. They are double-truck cars and are standard. For three years we contented ourselves with two motors on these cars. We put on twenty-five cars this year, and have contracted now for thirty to be delivered in April next, on which we shall put four motors, a motor on each axle, as an element of economy and greater facility and to give the public good service. The traction is much better, and we can speed up a car more quickly, and when you take a city where you stop every block, every 200 ft. or 300 ft., it is an important item if you can

save a few seconds in making these stops, and in getting the cars in motion. You thereby advance the convenience of the public and reduce the number of cars necessary to make up a schedule on any given line. For that reason we have incurred considerable expense in the improvement of these cars. We put on ten cars eighteen months ago, each car having four motors, and we find that it costs less for the maintenance of a car with four motors than for the maintenance of a car with two motors. The actual cost of maintaining the equipment under the car is reduced, and the number of cars in the shop averages only 2 per cent—we seldom have to pull one of these cars into the shop. The motors are not overworked, we can get the car up to speed within a very few seconds, and if a car gets behind its time it has the reserve power to enable it to make speed, which is an important element in the economical running of a street railway. If you can take five minutes out in the length of a run it is a great saving. For instance, we run pretty long lines, few of them less than 7 miles or 8 miles from terminal to terminal. We make 200 stops possibly in that distance, and a second or two saved in each stop, in getting up speed on the car, means a considerable amount in the number of cars necessary to equip and maintain the schedule. We have experimented on this subject very carefully. We know, of course, on our four-motor equipment—speaking off-hand, without figures—it possibly requires 30 per cent more power than to run two-motor equipments to pull the same car, but we are moving at higher speeds, saving money in other matters, and giving much more satisfactory service to the public, and we are saving wear and tear on the equipment. The cheapest thing we have on the road is power.

Mr. Foster: What type of motor do you use?

Mr. Beggs: We adopted as standard the G. E.-1000 motor. We put one motor on each axle. We have several grades, none very severe, but we have no trouble from slippery rails or frost in winter, and with our four-motor equipment we never think whether the car is going to get over the line.

The number of flat wheels has been greatly reduced, and in every way the cost of maintenance on a four-motor equipment is 25 per cent less than on a two-motor equipment. One of the reasons for our adopting the four-motor equipment is that we can give better service to the public, make more regular time, and haul larger loads. Our cars are very heavy—almost as heavy as the cars on a steam railroad. Our cars have twenty-two double seats and seat forty-four passengers. We frequently have over 100 passengers on these cars on account of there being wide platforms, the car being 41 ft. over all. That is the car we have adopted as standard after experimenting for three years, both as to the amount of power consumed and the wear and tear on the cars and rails, and, while we are running more motors on our lines, I do not think the number of men in the armature department is one-half what it was three years ago.

Mr. Connette: I do not mean to advocate a single-motor equipment, but I do say this: that with small cars, where the streets are comparatively level and where the power of the motor is in proportion to the size of the car, single-motor equipments can be operated for less expense than double. I know by actual meter tests that an 18-ft. closed car body, with single truck and two motors, requires about 150 kw. hours per day, of 125 miles to 140 miles. The cost of power, of course, varies, but a fair average is one cent per kilowatt hour. Therefore, if you use 150 kw. hours per day for each car and save 33 1-3 per cent, the saving of power would be 50 cents per car per day, and where thirty cars are run it means \$15 a day for power. From the experience I have had in maintenance I

consider that it will not cost as much to maintain one motor, even with a little extra service, than it does to maintain two motors. We think that two motors, involving as they do, four fields and two armatures, with all the incidental connections, must cost more to maintain than one motor, even with extra service; but where in larger cities you have larger cars and higher speeds and heavier travel, then perhaps our judgment would change in favor of the double motors, because more effective and satisfactory service can be obtained with two motors on a car than with one, but so far as the element of expense is concerned, I believe it is more economical to operate one motor than two motors, where it can be done, and I believe that it is limited to the smaller places and to places where the streets are comparatively level.

Mr. Foster: I would ask Mr. Beggs one question, and that is the average speed made by the four-motor equipment cars, and also if he uses power brakes, and if so, what kind?

Mr. Beggs: We do not use power brakes on our city equipments. In fact, where we run local service with interurban cars equipped with air brakes we shut them off in the local service. We try to maintain a speed of 8½ miles over the whole system. Speed is certainly an important element to take into consideration, as stated by Mr. Connette. We maintain one of the longest headways of any city in the United States for a thickly populated city, and one of the elements is the large cars and the great regularity maintained in the time table, which in the city traffic is kept up as closely as on steam roads. Even on our lines where we stop every 300 ft. or 400 ft., we maintain an average of 8½ miles an hour, and on some lines 9 miles an hour and over. No car makes less than 160 miles to 170 miles daily, and on our interurban lines we make as high as 380 miles a day to a car, day in and day out.

Mr. Foster: What type of motor is used? Is it a different type?

Mr. Beggs: The same motor exactly. We have to take the conditions into consideration, as Mr. Connette says. We have a considerable number of interurban lines spreading out like the spokes of a wheel, and we are trying to standardize the equipment so that if we need to send cars out on any line they have the element of speed connected with them. These cars are equipped with the ratchet brake. On our high-speed interurban lines we make a day nineteen trips of 20 miles each with two cars, and have done it for eighteen months. On these lines we have air brakes and arc lights, which are absolutely indispensable to a high-speed interurban line.

Mr. Foster: What is the maximum rate of speed on the interurban line?

Mr. Beggs: I should say that on certain portions we reach a speed of nearly 50 miles an hour. The line runs between the city of Milwaukee and the city of Waukesha, and for 6 miles or seven miles within the city limits we provide local service. On our city lines we have high-ratio gear.

Mr. Foster: Is the road on a public highway or private right-of-way?

Mr. Beggs: The particular line to which I referred is on private right-of-way. We have one interurban line 35 miles in length on a public highway. We do not get that speed on that line, but hope to reconstruct it so as to be able to do so.

Mr. Lang, of Toledo: I want to touch upon two subjects that seem to be most directly before the convention this morning, and the first is with reference to the maintenance of a brass foundry. In Toledo we are operating a street railway and an electric light plant combined, and we maintain a brass foundry, and I take it that that is an in-

dorsement, at least from our point of view, of the wisdom of maintaining a brass foundry, that is, assuming that we are giving proper attention to the item of expense. We pay our brass foundry man \$1.75 a day, and he is a good man. He spends his entire time in the brass foundry, and he takes every scrap of brass that we have and works it into every available place on the car, in the lighting plant and about the power-house where brass is used, and we are satisfied beyond any doubt that it is a most economical way to operate this part of a railroad. We cast our own trolley wheels. As I say, every brass fixture appertaining to the car is manufactured from our own furnace.

With respect to the double-car equipment, it depends, I think, very largely upon local grade conditions. We are operating two motors on each car, our standard being the No. 3 Westinghouse motor. We have a few G. E.-800 motors. A suggestion that I desire to make that may be of value to some of you is the fact that we have just entered upon a method of splicing two 16-ft. car bodies together. It has been a serious question with us what to do with four-wheel cars that have been in operation from eight to ten years, and following the same line of procedure that was adopted at Columbus about three years ago, we have just taken two 16-ft. car bodies and spliced them together and put them on double trucks. We have placed these cars upon one of our longest lines, where we have been maintaining a nine-minute headway for some two or three years, and found a necessity for increasing the accommodation. To avoid the necessity of running more cars we concluded to put these double truck cars upon that line, and have had them in service about sixty or ninety days. They look exactly like new cars. An expert could tell the difference, but the people who ride in them say: "What a magnificent car this is." They are pleased beyond measure with the new cars, and we think by that means that we are still going to maintain our nine-minute headway without complaint, because the cars seat more passengers and their speed is just as high as a 16-ft. car. It was argued that we would not be able to maintain our speed using two 25-h.p. motors, but in our city, where we have few grades, we find that we can maintain our speed just the same with our double-truck car as we did with our single 16-ft. car. As you can see, the former can earn a great deal more money. I think that where the situation of roads is similar to our own it will be found of great advantage to take some of these short cars that are nearly ready for retirement, and by putting in new sills and bracing them up properly, to utilize them for a long time.

Mr. Foster: Can you give us an idea of what it costs to reconstruct the two cars into one?

Mr. Lang: It costs in the neighborhood of \$300 for labor and material entering into the reconstruction of the car body. The car has longitudinal seats.

Mr. Dimmock, of Council Bluffs: Our company took some 16-ft. car bodies that had been in service for between six and seven years, spliced them together and made a number of cars measuring 42 ft. over all, including vestibules. We have run them for five years, and, outside of painting, they have required no repairs to speak of since the day they were rebuilt. I think the splicing of these cars cost us in the neighborhood of \$300 or \$400; I have forgotten the exact amount. We find that the double-truck car is better for the service. It was claimed that we could not keep up our schedule on the same headway, after splicing these cars, and especially so after putting gates on them. We equipped these cars with gates, which are operated with a lever controlled by the motorman, and we find that the power consumed is somewhat greater than it was before the gates were put on, on account of the additional number of complete stops required to be made.

Nevertheless, the car is giving better service and running on the same time-card as that of the 16-ft. car. The speed of the car in many places is as high as 30 miles an hour, and the repairs are not more than they are on another line, where 16-ft. cars only are used.

Mr. Beggs: I would like to ask whether the cost of splicing the two 16-ft. car bodies referred to includes the trucks?

Mr. Lang: No, sir.

Mr. Beggs: What kind of trucks do you put under them?

Mr. Dimmock: Double trucks.

Mr. Beggs: That is an important question, because we have canvassed that matter thoroughly, and finally determined that it is not economical to splice our old car bodies, for the reason that by the time the trucks are under the car, the cost of the car is fully half the cost of the best car that can be built, and after spending this money you still have an old car. As Mr. Lang has said local conditions have a great deal to do with the question. For instance, this summer, in our city on the lake, we had very little warm weather to require people to take pleasure rides in open cars. We ultimately intend to dispense with the open cars and get the equipment down to standard equipment to be run twelve months in the year. To-day we put cross-seats in our cars, and this requires greater width than with the longitudinal seats. Our cars are 8 ft. 6 ins. wide, giving two cross-seats with a good aisle, and about 33-in. cushions on the seat. We made a careful estimate of the cost of reconstructing the old car bodies, and we found that it would be one-half the cost of the most modern car, with 7-in. sills, and we did not consider it a matter of economy. We do not want any longitudinal seats on our line. Our patrons prefer our standard car, and with the window sash down it is virtually an open car for all intents and purposes. Our cars are ready to run any day during the year. The amount of money spent in splicing these car bodies does not begin to include all the expenses involved, and then you have nothing but second-hand equipment. I think you will all admit that when you take an old car body built for the lighter traffic of ten years ago, and endeavor to reconstruct that car, that it will only be a short time before the car begins to creak again at the joints.

Mr. Dimmock: We have run our cars five years without repairs, but in order to make our car as good as we thought it ought to be, we had a steel frame put around the bottom of it, with truss rods, which caused the car to stand all the racket of bad track, etc. I will admit one point, however, that if we were buying new cars we would prefer them lighter and with cross-seats. We have also spliced our 16-ft. open cars, and the difference in the two cars is that the closed car seats forty-four persons, while the open car seats seventy-five. Another feature was the track centers. Our track centers will not permit of a wide car, and this fact aided us in making a decision to splice the old cars. If the track centers had been wider we might have considered the purchase of new cars. We feel we are money in pocket by the splicing of the old cars, under the circumstances which exist in our city.

Mr. Foster: What is the depth of the flange on your wheels, Mr. Beggs?

Mr. Beggs: I think 1 $\frac{1}{4}$ ins.

Mr. Foster: Do you run them over a girder rail or a T rail?

Mr. Beggs: Our standard road-bed construction is a T rail with granite headers and stretchers. We form a groove out of the granite, and if you came to the city of Milwaukee you would see the same effect as with a grooved rail without the gnawing. In the city limits every

foot of track is put down so as to admit paving in any way that the city wishes to do it. We use 6-in. T rail weighing 70 lbs. to the yard.

The President: Gentlemen, this is straying a little from the matter immediately before us, and encroaching on the subject of a future paper. This paper is on the subject of car equipment. I think we should be glad to continue the discussion of the subject directly in hand.

Mr. Dimmock: Before we get entirely away from the question of trolley wheels, I would ask if any of the gentlemen present has kept the mileage on the trolley wheels?

Mr. Beggs: We get about 8000 miles or 9000 miles from our trolley wheels. I know of roads that get as high as 17,000 miles. Our policy is to prefer to wear the wheel. Our wheel is made up of a composition of 86 per cent of copper, 8 per cent or 9 per cent of tin and 4 per cent or 5 per cent of zinc, and we get a composition which wears the wheel rather than the trolley wire. Our trolley wire is No. 0000 over our entire system. We get about 9000 miles from our trolley wheels, and do not want any more. It costs less to wear a trolley wheel than it does to wear a trolley wire. The cost of putting up the wire is as great as the wire itself. I know there are some certain roads that make a boast of the number of miles they get out of a trolley wheel. They used a steel wheel in Milwaukee three years ago and were grinding the trolley wire constantly.

The President: Is there any further discussion upon this subject? If not, I think we should proceed to the subject of "The Modern Street Railway Shop: Its Design, Machinery and Shop Practice." It is a subject that I am sure everyone here is anxious to talk about, and, in the unavoidable absence of Mr. Kilgour, who, we expected, would speak on this subject, I am in hopes that it may be started by Mr. Knox.

Mr. Knox, Chicago: I was only notified a couple of days ago that I was expected to participate in this discussion, and I have not given the matter any special thought. I was hoping a paper would be presented to the convention. I consider it one of the most important problems we have, where there are perhaps greater leaks than in the other things we talk more about. I have not been able to give the subject proper consideration, however, and must beg you to excuse me from going into it with greater detail.

The President: I hope we shall hear from some other gentlemen on this subject. If there is to be no discussion on this subject the Chair will announce the committee of five to make nominations for officers for the ensuing year and determine upon a location for the next meeting. I appoint for this committee H. C. Moore, Trenton, N. J.; E. C. Foster, Lynn, Mass.; E. G. Connette, Nashville, Tenn.; Robert McCulloch, Chicago, Ill., and A. E. Lang, of Toledo, Ohio. Invitations to the association to hold its next convention in any city should be presented to this committee, and any argument or inducement held out by any city should be laid before them. This does not, of course, in any way preclude the presentation of any argument at the time of the committee's report.

Secretary Penington then announced that luncheon would be served on the special train taking the delegates to the drainage canal. The meeting then adjourned.

THURSDAY'S SESSION

The president called the meeting to order at 10:35 A. M.

The secretary read a telegram from H. M. Watson, of Buffalo, N. Y., regretting his inability to be in attendance at the meeting, owing to business engagements. The secretary also read an invitation from the Westinghouse Electric & Manufacturing Company to visit the power-house of the South Side Elevated Railroad, the privilege to do so

having been granted by the railway company. A special train was arranged for to leave the office of the South Side Elevated Railroad Company at 2:30 P. M. on Friday. The secretary also announced that the delegates were requested to be in readiness at the Auditorium Annex at 1:45 P. M., to start on a tally-ho ride.

The President: The first paper to be read this morning has been prepared by Edward Butts, of the Metropolitan Street Railway Company, of Kansas City, Mo., and the title of the paper is: "The Construction and Maintenance of Street Railway Track."

Mr. Butts: The paper I am to read has been prepared on the basis of our investigations in Kansas City for the past five years. It is our conclusion that the track construction described in the paper is that best fitted for the conditions presented. [Mr. Butts then read the paper, which is published elsewhere.]

Mr. Foster, of Lynn: I have listened with a great deal of interest to the paper on the "Construction and Maintenance of Street Railway Tracks," so ably presented by Mr. Butts. It seems to me that he has covered the ground pretty well for drawing up specifications for the building of a first-class girder-rail track. I did not notice that he touched upon the construction of T-rail track. It is necessary to construct the tracks of our roads differently, according to the different localities. The city roads in all of the cities with which I am familiar require a much superior track than the roads located in suburban towns. I notice a reference in the paper to the girder rail being laid on blocks, the rail spiked to blocks and then surrounding that with concrete. I should say from my observation that there might possibly be a better method than that. I trust the gentleman will pardon me for so expressing myself, but it seems to me that it would be better policy, in laying girder rail on concrete, to omit the introduction of any wood, because with the passage of time this wood must decay, and when it does decay it will weaken the structure.

Mr. Holmes, of Kansas City: Mr. Butts should have explained that these blocks are used only for the purpose of alignment, and not to support the rail.

Mr. Foster: I did not so understand it; I understood the blocks were put in there for the purpose of maintaining the track. As I understand it now, they are put in there temporarily, simply to surface the track, and there is no use of going further on that line. I should think, however, that the concrete base under the rail was superior to any other method.

The subject of cross-ties is one which we meet in almost every section of the Eastern country, as over 90 per cent of the roads there are using cross-ties. The kind of a tie and the dimensions of the tie are two points in which I am interested. Some roads use a 5-in. x 7-in. tie, 6 ft. 6 ins. in length, placing them from 24 ins. to 30 ins. on centers. On a T rail, where you are going to operate at a high rate of speed, as many of the electric roads now anticipate doing, and many, in fact, are doing at the present time, it seems to me that we should use a tie of about the same dimensions as the ties used on steam railroads. We are at present constructing 5 miles of double track with the T rail. The ties are 6 ins. deep, 8 ft. long, and run up to 10 ins. in width, being practically a steam railroad tie. We are laying on this tie a 70-lb. American civil engineers' section of T rail, and are using one of the improved joints. In the construction of this track, which will be used by cars running 25 miles or more an hour, we believe we should adopt as near as possible the steam railroad construction. On some of the smaller and less important lines I do not think it is necessary to have so heavy a rail, although I am thoroughly of the opinion that money invested in a heavy rail and a very heavy cross-tie and a

track of the best construction possible is money wisely invested.

All our girder rails are laid on cross-ties 5 ins. x 6 ins. x 7 ft. in length. Some roads are using a tie 7 ft. long, and others use a tie 6½ ft. long. I think that in some cases a tie 6½ ft. in length is not sufficient. Where the street is concreted you get but a small bearing on the outside of the rail, and it seems to me that an additional 3 ins. on the outside of the rail, if you use a tie 7 ft. long, is very important. It adds very materially to the strength of the track and keeps it in surface and alignment. This subject is one that we might talk about for a long time, relating our experiences and giving our opinions. It is possible for a man to get up and tell theoretically what kind of a track should be built, but he must take into consideration the financial condition of the road to be operated. All of these things enter into the construction of the track—the question of how much money can be put into it. We all agree, I believe, that the first construction should be of the best, provided the finances admit of it.

The question of maintenance is also important, as important, perhaps, as construction, and with many it is a problem as to how best to repair an old track. We all remember very well that in the old horse-car days we used to operate over a rail weighing only 20 lbs. to the yard, spiked to a stringer and underneath that stringer was a little tie about 4 ins. x 5 ins. We then went from that rail up to the 25-lb. rail, the 40-lb., 45-lb. and 50-lb. rail, and then to the 60-lb. rail; all of these weights were made in a tram rail and about as many in the T rail. Then we commenced with the girder rail of 40 lbs., then 45 lbs., 50 lbs., 70 lbs., and now on most roads, where it is necessary to lay the girder rail, a 9-in. 90-lb. rail is being used. It is with these lighter rails to which I have referred that the problem comes in. We have some 45-lb. girder rail made in 1890, mounted in steel chairs on small ties, 4 ins. x 5 ins. x 6½ ft. in length, 3 ft. on centers, and that was thought to be a modern construction at that time. The road to which I refer is 6 miles in length, and was acquired by our company by purchase. The people who built it made a pretty thorough investigation at the time it was constructed, and thought they had secured the ideal construction for a road for electric operation. Time has shown that they were in error. Now the problem with us is how to utilize that rail to the best advantage. The lips of the steel chairs have become worn to such an extent that they do not hold the rail securely. We do not believe it wise to purchase new steel chairs, so we have been substituting the old-fashioned stringer for the chairs, knowing that we can obtain from six to seven years' life in the stringer, and thereby get six or seven years out of the rail. The head of the rail is worn but very little. I believe this plan to be economical under some conditions where the traffic is light. Of course, where the traffic requires a fifteen-minute service, and from that down to ten, twenty or thirty cars a minute, or as many as can be run on the track, of course the latest and most modern type of track construction is necessary.

Caring for the T rail is another subject for consideration. While a 35-lb. T rail may answer the purpose—some steam railroads are operating over a 35-lb. T rail—I believe it will not do so successfully on a cross-tie. It is very difficult to hold the joints even with any of the improved joint-plates, and there are some very excellent plates on the market.

The method of cast welding is another solution. I suppose this might be applied to some of the old track, and, in fact, it has been, but I have questioned the wisdom of applying it to the 26-lb. rail. Many of the rails laid on the roads in 1890, 1891 and 1892 were very soft and wore out

very quickly. The trouble seemed to be due to a defect in the formula for mixing the metal and rolling the rails at that time. That, of course we realize, has been very materially improved, so that to-day we have a very high carbon rail. I believe that on many of these smaller roads this light rail can be used, perhaps, successfully and profitably, until the finances of the road will permit it to introduce a more modern and better construction. To my mind, the local conditions and the ability of the company to make the outlay are important factors in determining what is best for the property.

Mr. Hawken, of Camden, Maine: In New England the question of the railroad tie is a very important one. We have used what we call a hackmatack tie. We also use the cedar tie, the oak tie and the chestnut tie, and I would ask Mr. Foster what kind of a tie he has found to last longest and to give the best results?

Mr. Foster: In reply to the gentleman I would say that our experience has been that the chestnut tie gives the best results. We use many of the soft woods, such as cedar and hackmatack, but think that the best results have been obtained from the use of a chestnut tie.

Mr. Keegan, of Toronto: It seems to me this discussion raises a very important question as to the advisability of rigid construction on lines where there is heavy traffic. I have had occasion to construct some lines upon a concrete foundation where the traffic has not been excessively heavy. The results so far have been very favorable indeed, but it would be very interesting to learn from some cities, where they have adopted this rigid method of construction, whether any observations have been taken to determine if there is any yielding in the rail. I have had observations taken on other lines, and find that the give in the rail is very considerable. Of course, where there is a heavy travel this method of rigid construction has been adopted, but it is a question if it does not affect the rolling stock; and I should like to ask Mr. Butts if he has made any observations to determine whether there has been any give in the rail when heavy loads pass over it; also the style of cast-welded joint he has adopted? I take it that it is what is generally known as the Falk joint. I should also like to ask if any provision was made for contraction and expansion of the rails. I know that some companies do not make any such provision, but I understand that in some places a great many broken joints have been the result. I would also inquire what provision is made for contraction and expansion while the construction is proceeding on long lines. The action of the sun in hot weather upon these rails, if the rail is exposed, naturally would be rather disastrous.

Mr. Butts: We have operated a road for the past four years, as outlined in the paper, and there is no perceptible tremor, deflection or yielding of the rail. We have been constructing track on this system continuously every year from that time up to the present day, and we are still doing so. Any tremor would probably be caused only by the use of poor material or employing soft material too close to the rails. In regard to the cast-welded joint and the expansion and contraction of the rails, I would say that our method has been to put the concrete around the rails before the welded joint is put on. That holds the rail in place perfectly, and there is no displacement on straight lines, although we have had to do some little extra work on curves on account of cast-welded joints on the curves. This was because the joints were put in before the concrete had settled thoroughly in these places. In concreting the track we leave an aperture where the welded joint is to be placed. After the concrete has set a sufficient time we go along with the welding machine and cast-weld the joints. In that way we have not had any bad results.

Mr. Jones, of Memphis: I would like to hear from Mr. Butts or some other gentleman who has had experience with this rigid foundation for the track, as to how he arranges to put in that construction and operate his road on the regular service.

Mr. Holmes, of Kansas City: We use portable cross-overs, and cut out so many feet of the track, say 1000 ft., depending on the traffic on the line. The cars going in both directions use that one track for that distance. If the weather is warm the concrete will set in four or five days, but, of course, it is very slow work. It is sometimes possible to divert the travel from the track which is being rebuilt, and to put the cars on some parallel street.

Mr. Wason, of Cleveland: There are one or two points which have developed in the use of cast-welded joints that we have laid in Cleveland, which hardly encourages us to repeat the experience. We have had some experience with electrically welded joints of this character, but we have been unable to keep perfect alignment, both as to gage and surface. The track which we have put together with the twelve-bolt angle-plate has proven much more satisfactory than the cast-welded joint track. We have not used the foundation which Mr. Butts has described, but we have a very liberal supply of ties with very careful tamping. We are now using broken stone cement around and underneath the ties, allowing it to set and afterwards filling up underneath the rail. I do not think we shall use the cast-welded joint any longer, but depend entirely on the angle-plate with the twelve bolts to hold the track in line. It does not seem to me that it is possible to ignore the contraction and expansion of that amount of material, no matter if it is seven-eighths covered in the ground and held in place in a measure by concrete or block pavement. The suburban work, it seems to me, cannot be made too well, and if you follow the lines laid down by steam railroad practice you surely will not lose money. If you cannot afford that construction, do not build the road.

Mr. MacGreggor, of Houston: Mr. Butts does not say anything of cast-welded construction in unpaved streets. I presume he has had some experience (I have had a little), but I do not know whether he has had any unfavorable results in using cast-welded tracks in streets not paved. The question of bonding is not mentioned in his paper, and I would like to know whether the tests for carrying the large currents without any bonding through the cast-welded rail have been satisfactory. Then there is another question, which perhaps hardly belongs to that paper, and that is the matter of the head of the rail, on which I would like some information. I have taken a fancy to what is known as the Trilby head of rail. I have not used any, because I have always been able to use a T rail, but it is coming to that position with us that we will have to use something else to satisfy the municipal demand, and I would like to know from somebody who has used it if the Trilby rail is satisfactory for a girder rail. Another trouble we have had is that the large roads are setting the pace and the small roads are expected to come up to their standard. Yesterday the difference between the small roads and the large roads was exemplified in the use of four motors on a car. I can readily understand that a company having a large business can feel it to be a matter of small expense to use four motors, instead of one or two; but to a road with small business and fixed expenses it would be a disadvantage, and I think that if we could draw a distinction here between those roads which have all the business they can handle, and more, too, and those roads which have not the business, we will get a standard for each, and I think that is what we need.

Speaking of this rail question, the large roads have set a

pace requiring a 9-in. rail. I have been using a 6-in. T rail. I wanted to get a girder rail to correspond with that 6-in. T rail, but the supply people cannot furnish it, except with a 4-in. base. I do not think anyone running an electric railroad desires to put down a 4-in. base-rail, but that is all I could buy—a 4-in. base with the old-style head. I want a wide base and a modern head to the rail, but they say that everything in this style is 9 ins. high. We have not any ballast down our way, and we try to get up near the top. Every mile of concrete that we lay costs us \$1200 a mile, and we skim along because our pocketbook is thin and we want a standard to carry the light traffic we have. We earn from \$10 to \$25 a car day, and many of these large roads earn from \$50 to \$100 a car day. We want to get into the small road class, and have some discussion here which will apply to that class of roads.

As to the experience with ties, being close to the cypress swamps, we use cypress ties, which are creosoted. My experience has been that the lengthening out of the tie to from 7 ft. to 8 ft. does not benefit us. With the question of bonding is brought up another question of the experience, outside of the paved streets, with the cast-welded joints. I am putting in cast joints, but I have not yet the experience to enable me to express an opinion on the results. I would like to hear from those who have had experience along this line.

Mr. Heidelberg, of Chicago: I did not intend to say anything when I came here, but hearing the cast-welded joint discussed so much, I must say that our company was the second to employ this joint after it was introduced. St. Louis was the first city to try it, and we were the second, and in 1895 we started to put the cast-welded joint on our road. There has been some discussion here about the alignment and the level of the track. I will call your attention to some track that was laid only last week on Eighteenth Street, from Wabash Avenue to Indiana Avenue, and on Indiana Avenue, from Eighteenth Street to Thirty-ninth Street. We have 10 miles of this track on Halstead Street, from Archer Avenue to Sixty-ninth Street, done this summer, and I do not think that you will find one joint out of alignment or out of level. I can only tell you the experience of our road, as I never worked for any other railroad, and have been with this company for fifteen years. In the matter of ties, I believe that local conditions have a great deal to do with the life of a tie. I have made experiments, and find that the creosoted cedar or hemlock tie is the only tie to use in sand, whereas in a clay soil we have found white oak the only tie to use. We use a 5-in. x 8-in. x 7-ft. tie, chisel-point spike and side brace-plate, which we use extensively on our own road, and a great many other people have now adopted the brace-plate that we use.

As to the rails, we have tried all kinds. First we had the old flat rail, and from that we came to the first girder rail made, 42-lb. Johnson, and then 63-lb. Johnson. Then we went to the 70-lb. 6-in.; to the 77-lb. 7-in.; to the 85-lb. 7 3/16-in., and then we took up the improved 9-in. girder rail at 90 lbs to the yard. We laid a great deal of this latter rail, but it did not give satisfaction. The reason is that we have various kinds of pavements, such as macadam, cedar blocks, etc., and the rail was too high, it rocked too much on us. Another fault that we found with the 9-in. 90-lb. rail was that the web was too thin for the height. The extreme changes of weather here, in winter we sometimes get a warm rain in the morning and a hard, cold snow storm in the afternoon, were too much for these rails, and they would pull and break, because the metal was rolled out too thin. We would like to construct our roads as we wish, but the municipal conditions will not allow us to do so.

Some one spoke here of putting the concrete under the rails. We have none of this form of construction, but our cable lines are all laid in concrete, and we find that in from eleven to fifteen years the concrete rots out and crumbles. Our yokes and rails go down into it, and it becomes a trench, and every time a car goes over it it oscillates and goes down. When it does so you know what it means—the car is being pulled up hill all the time, and that means power.

Mr. Butts, in his paper, stated that he poured the metal for the cast-welded joints at a bright yellow heat. My instructions to my men are to pour no metal into a mould unless it is at a white heat. If it is not at a white heat they are to make a pig of it. The reason is that after sand blasting the joint and getting all the pits of the rail perfectly clean the metal must be very hot in order to flux and amalgamate to the rail. If you do not do that you are not sure of a bond. When you do that, and have a man watch and see that the metal is at a perfect heat, then your bond is sure, for we have made a great many tests, and have not found any defective electrical connection when this method is carried out. In the early part of the history of welded joints we were a little skeptical about the process, but on making test after test and becoming more thoroughly acquainted with this work we found that the extra bonds were useless and a waste of money.

As to the matter of maintenance, no one seems to have spoken of organization in maintenance. In the maintenance of railroad tracks it is very essential to have a thorough organization of all the men under you, so that you can get them together at any time. I can get all of the force in our track department together at one point inside of an hour. That is a point which everyone should study. Track work has been my study for years, and I believe in giving the men good tools and having them thoroughly organized. We have a track master and a section foreman. We have six sections on our road and nearly 40 miles of road in each section. The sections are not divided strictly according to length, but according to the attention that they require; that is, if there are many railroad crossings in one section we take some straight line off that section and put it on some other section. The employees for each section are summoned by one man, whom we term a caller. The telephone operator at the main office calls simply this one man in each section, a man who lives near to the barn, and that caller calls all the rest of the men and tells them where to go. These things are very essential, especially in the North, where a hard drifting snow with very cold weather may come upon one in thirty minutes.

In conclusion, I wish only to say that I have been trying for eight years to cure a certain thing, and that is a wavy rail. We have some rail here which is what we call a wavy rail—there is a depression in the rail about every 3 ins. I have taken that rail out and sent pieces to the best experts in America, but I have never got any satisfaction from them. I want to know if anyone can tell me what is the cause of the wavy rail.

Mr. Butts: In answering some of the questions I would say that I have not advocated in my paper anything less than a 6-in. rail. We have not experienced any breakage of welded joints, and we have welded not less than 3000. They do not break, because the heat is refracted off into the earth as fast as it enters the rail, so that there is an equilibrium throughout. I would like to inquire what depth of rail the gentleman has on his cable construction?

Mr. Heidelberg: We now have a rail 7 3-16 ins. in depth. Previously we had a 6-in. rail, with a foot and a round base.

Mr. Butts: The rails in cable construction are laid on

yokes, spaced every 4½ ft. to 5½ ft., and are not imbedded in concrete, but are supported entirely by the yokes, and therefore the experience with concrete in cable railroads does not apply to the concrete trench construction, as we understand it. For instance, there is a vibration between these yokes that will wear out almost anything. It is not a rigid construction. We do not bond the rails where they are cast-welded. The welded joint has the full electrical capacity of the rail. Where we do not put on the welded joint we bond with a No. 0 bond. We have had no experience with cast-welded joints in unpaved streets, but I believe that the success of that problem depends entirely upon the amount of metal that is embedded in the earth, as compared with the amount of metal exposed to the sun. I do not see why, if it could be maintained imbedded in the earth, it would not be as successful as if it were imbedded in other material.

The President: We shall now call for the report of the nominating committee, of which Henry C. Moore is chairman.

Mr. Moore presented the following report:

CHICAGO, Oct. 19, 1899.

To the President and Members of the American Street Railway Association:

Gentlemen—The nominating committee respectfully reports that it recommends Kansas City, Mo., as the next place of meeting, and the following gentlemen for officers of the association for the ensuing year:

For President—John M. Roach, general manager, Chicago Union Traction Company, Chicago, Ill.

For First Vice-President—John A. Rigg, president, Union Traction Company, Reading, Pa.

For Second Vice-President—H. H. Vreeland, president, Metropolitan Street Railway Company, New York City.

For Third Vice-President—F. G. Jones, vice-president, Memphis Street Railway Company, Memphis, Tenn.

For Secretary and Treasurer—T. C. Penington, treasurer, Chicago City Railway Company, Chicago, Ill.

For Executive Committee—President, vice-presidents and C. S. Sergeant, second vice-president, Boston Elevated Railroad Company, Boston, Mass.

C. K. Durbin, general superintendent, Denver Consolidated Tramway Company, Denver, Col.

Nicholas S. Hill, Jr., general manager, Charleston Consolidated Street Railway & Electric Company, Charleston, S. C.

Charles W. Wason, president, Cleveland, Painesville & Eastern Railroad Company, Cleveland, Ohio.

John R. Graham, president, Quincy & Boston Street Railway Company, Quincy, Mass.

Respectfully submitted,

HENRY C. MOORE, Chairman.

E. C. CONNETTE,

ALBION E. LANG,

E. C. FOSTER.

Mr. Moore: The committee received invitations from three places—Cleveland, Kansas City and Charleston. We found ourselves in a very difficult position. We love you all equally well, but we had to make a decision. We have also received an invitation from the city of Milwaukee for the year 1901, and from the city of Toledo for the year 1902.

Mr. Harrington, of Camden: I move that the report of the committee be accepted and the secretary authorized to cast the vote of the association for the gentlemen nominated, and for the place of meeting next year. Carried.

President Sergeant appointed Mr. Dimmock and Mr. Connette as tellers to receive the vote.

The secretary duly cast the ballot for Kansas City as the place of meeting and for the election of officers as nominated by the committee.

The President: I am pleased to declare that the gentlemen nominated have been elected, and that Kansas City has been selected as the place for the next meeting. (Applause.)

Mr. Holmes: Gentlemen, I desire on behalf of Kansas City and the Metropolitan Street Railway Company, which I represent, to thank you all most sincerely, and especially

the committee, for this compliment. I will say that while you are with us in our city we will do everything we can to make your visit a pleasant and profitable one. (Applause.)

The President: We will now have the pleasure of listening to a paper by Ira A. McCormack, of Syracuse, N. Y., on "Train Service and Its Practical Application." This paper is published elsewhere in this issue.

The President: Gentlemen, we are to be congratulated on having so interesting a paper on a subject which I think has never been presented to us before. We are indebted to W. H. Holmes, of Kansas City, for the suggestion of this subject, and I think it is only fair to ask him to say a few words upon it.

Mr. Holmes: I do not know that I can add very much to what has been said already on this subject by Mr. McCormack, but I will touch on a few things here before we adjourn. This is hardly a time to grow reminiscent, but my connection with the street railroad business dates back twenty-two years. I well remember when Kansas City was visited by the grasshoppers, which swept everything before them. It was not then a question of how much it cost us per car mile or per kilowatt hour, but the questions which concerned us were what would be the average life of the street car mule, and whether corn would sell at \$1.50 per bushel. I am glad to say that we have grown from a little city whose street car needs could be filled with five cars to a large city carrying 50,000,000 people each year on the street cars, and with every indication of a continued growth. In this connection it seems to me that the employment of men is one of the important things to be considered, and I think it is pertinent. We have adopted a plan of setting aside a portion of one day in each week, which is Monday morning from 9 o'clock to 12 o'clock, to receive applications for employment, and at that time we generally call in some of the division superintendents to look the men over as they pass through the office. After selecting what men we need, they are required to make out an application, stating where they have worked and giving us such references as they are able to give. We have found that to be the best way of handling the matter, and we have been able to get very good men. I think this is a very essential thing in the street railway business, as Mr. Vreeland very happily said. The treatment and handling of the men is a very vital thing in the management of street railroads. I think it is possible to have your men like you and respect you at the same time. I have arranged this winter to give my men, the motormen, especially, a course of lectures, and have arranged with Professor Black, one of the best lecturers in the West, to come to Kansas City and deliver to our men a lecture on the practical application of electricity, at least every two weeks during the winter months. Our company will carry the matter as far as the men want to go. If they want to take a course in electricity, we shall be glad to see them do it. My opinion about the train service is that we are merchants, and we are selling rides, and we should use great care in the selection of the men, as the company is judged almost entirely by its employees. The public seldom comes in contact with the president or manager, and I think it is of more importance than anything else to use great care in the selection of men. We have followed the policy of promoting men from the ranks. We think that it is best to select married men, if we can find them. Many young married men come to our city to study the professions. They become dentists and doctors and lawyers, and often take up street car work for three or four years, until they complete their education.

The President: There is one street railroad in the United States that has the most difficult problems to deal with of any road in the country. That company, for-

tunately, is represented here, and I think that we ought to have a few words from Mr. Vreeland, of New York City, on this subject.

Mr. Vreeland: Any information that I could give the association with reference to this important subject presented by Mr. McCormack would hardly be available with the work on most street railroads. The work that we have in New York City, the greater part of the twenty-four hours, is to see how many cars we can run on the lineal feet of track which we have, consistent with the right-angle crossings at various points. Right-angle crossings and terminals govern our headway more than anything else on the greater part of the system. No doubt some of you gentlemen noticed some remarks I made, which I think were copied from the railroad papers, to show the magnitude of our proposition. The steam railroads of the United States last year handling 560,000,000 passengers, approximately, within the borders of the United States. We moved last year 265,000,000 cash passengers and 90,000,000 of transfer passengers, or a total movement of nearly the total of the whole of the steam railroads of the United States. (Great applause.) By these figures of comparison you will see, as Mr. McGregor said some time ago, you will have to make a separation of this proposition, and we will have to put our worthy president, Mr. McCormack, Mr. Holmes and a few of us in one class, and talk on these matters among ourselves, because these conditions do not obtain very largely in other systems.

I might say, by the way of following the lines as suggested by Mr. McCormack, that our system is handled with reference to time tables and the method of regulating time tables and making time tables, on the same general plan, as Mr. McCormack has suggested, and on the lines which we have frequently talked over together. The essential thing in arranging traffic, irrespective of its volume, is a study of conditions. The division superintendent and the general foreman, with the amount of detailed business that they have devolving upon them, are not the men who can make a time table. I made all the time tables for one of the largest steam railways in this country for five years, and I would not attempt to make a time table for one of our lines in New York. A man must give his time and attention to the local question surrounding the problem. An expert comes to lay out a prospective railroad, and his ideas of what the volume of business, of what that property is to get, are based upon a complete and thorough study of the characteristics of the particular section of the country and its people. The same study must be made with reference to the daily requirements of the street car lines in car mileage and the distribution of the same. To show how essential this is, I will say that I had a conversation some time ago with a superintendent who had operated a very large line for twenty years. I said to him one day: "What are the heavy hours of traffic on your line? How are you distributing the car service?" He said: "During the commission hours we run a large service, and then we reduce the service, and put it on again in the commission hours in the afternoon." I said to him: "Do you know that during the middle of the day you have the heaviest hours of traffic on your line?" He claimed that it was not so, and I told him that I would prove it to him by figures. I had a man take it up, and I actually showed that superintendent, who made a time table to regulate this running time, and took off cars during the middle of the day, that more people were moved per mile of track between 12 and 2 o'clock than during any other two hours of the day, and that during this time his cars were stored in the house. He used his best judgment, predicated upon some years of experience, by giving

the fullest service in the early morning and in the evening, but did not give it at the time it was actually most required.

We do not allow a division superintendent, a general foreman nor a chief inspector to make time tables for our system. A study of the situation is made thoroughly, as indicated by Mr. McCormack, and then the time table is laid out by a man who is employed for that purpose and followed up in that way. I shall take your time a little longer, and give you an illustration to show how pertinent these questions are. East and west of Central Park, in New York—of course, I can only bring illustrations from the line with which I am actively engaged—there are three lines on each side of the town. The arrangement of the car service on these lines was almost equal during the early hours of the day, but a close study of the people and their habits brought us to the conclusion that on the east side of the town the large car service should be started at 6 o'clock in the morning, and the large car service on the west side of the town should be started at 8:30 o'clock in the morning. We were previously running very nearly the same service on both sides of the town, and the change meant, of course, the saving of a great deal of money.

On the question of the average of speed, etc., we have to study these factors very closely to keep these things moving. We found it was impossible, even on short distances, to keep up the voltage of our lines during the hours of heavy loads, and we had to put in 4000-h.p. capacity storage battery plants, which are automatic in their action, to keep the voltage up, so we could do our business. For a long time there was a question of what affected the time tables. We sent out men to take measurements, and it was determined that it was not the fault of the motormen, although at first they were blamed for it. They would have a car full of passengers, and the voltage was down to 400 or 450. By the increase of power obtained through the use of the storage battery plants we keep a uniform voltage of approximately 550 volts and meet the condition in that way.

The question of efficiency of employees, questions of that character are all pertinent to be discussed in this connection.

I think that traffic diagrams are the most important things for a man to have in connection with the operation of a street railroad. We have traffic diagrams taken at least once in every two weeks of every division of our system for the twenty-four hours—passengers against hours, similar to the one furnished by Mr. McCormack, and a copy of that is furnished to the general foreman or inspectors on the line, as well as the man who makes the time tables. Our diagrams go into the volume of business, showing the number of passengers carried per hour in each direction on every line of the system, in the twenty-four hours; thus, between 9 and 10 o'clock 4000 passengers went south, and from 9 to 10 o'clock 3000 passengers went north over the system. It is impossible to get any system of accurate inspection that will show where these people get on and off, without supplementing this work by the system which Mr. McCormack indicated, of special inspectors at certain points. I can say, heartily agreeing with the paper of Mr. McCormack, that it is very valuable for all of us to consider in connection with our work and that it would be utterly impossible for us to do the business we do in New York City, running the number of cars and handling the number of people we do every twenty-four hours, without making this one of the very important studies of our transportation department.

Mr. McCormack: I will ask Mr. Vreeland whether, in making a diagram of this kind, he shows the up and down trips in parallel, as I have? In my diagram the upper

line shows the down trip and the lower line shows the up trip. You can see the traffic is uniform there from 5 to 8, and then on Sunday we show the traffic curve up and down by different lines.

Mr. Vreeland: It is our practice to sub-divide the blue-print sheets, using the upper half for the twenty-four hours south bound and the lower half for the twenty-four hours north bound. We worked on the system that Mr. McCormack has laid out there, but I do not consider it as valuable for the regular operation as it might be for this purpose here, and the fact that you put these charts of traffic in the hands of men who must take them in at a glance. They are not time table men, but practical operating men, who are going to criticise the time table, and you must have it so that it is a graphic illustration of the idea you want to convey. By interlacing your lines you throw it out. We show a clean sheet of south-bound and north-bound business on the same sheet, the two peaks coming together towards one another and practically making it the same, although they are distinct in their location on the chart.

The President: We want to get both sides of this subject covered, the small roads as well as the large ones.

Mr. Heidelberg: I am interested in the question of train service, and there is one question I would like to ask: The greatest trouble to-day in our train service in Chicago is something we do not seem to be able to cope with, although we have tried in very way, and that is the trading of transfer tickets at transfer points. I understand that in New York City they have had this matter before the State courts, and I would like to hear what they did with it from Mr. Vreeland. The situation here is that anyone riding over a line in Chicago will find at a transfer point a boy who will transfer you. The boys get the transfer tickets and sell them, and another passenger will ride on the original nickel paid the company.

Mr. Vreeland: I fully appreciate the difficulty under which the transfer business is done in Chicago, because in walking up-town the other day I stepped into a drug store to buy a cigar, and when I was going out the clerk said: "Are you going to take the cars, if so, here is a transfer." The transfer went with the cigar. The history of this thing in New York is a long matter of detail, too long to bring before the association at the present time, and I would suggest for the information of the gentleman that this subject was very thoroughly discussed, not only by our attorney, but by the men who are the head of our transfer business, together with the gentlemen who handle the transfer system of the Brooklyn Heights Railroad, which is as intricate as ours, at the convention of the New York State Street Railway Association held last month at Ithaca. It is fully given in the report published in the Weekly News Edition of the STREET RAILWAY JOURNAL for Sept. 16, and while I would be glad to give the information now, I appreciate the fact that it would be altogether too long to take up the time of the convention to do it. The answer of our attorney to a similar question propounded by some one with reference to the effect of that law was very full.

Mr. Dimmock: I would ask Mr. Vreeland what laws in the State of New York, if any, govern the crowding of the platform, and what the rules of the company are pertaining to the passengers crowding the rear platform of the car?

Mr. Vreeland: There are no regulations on this matter, except the regulation of the Board of Railroad Commissioners that passengers shall not be allowed on the front platform with the motorman of either open or closed cars. We did not follow it and a law was introduced to compel us to close the front gate and also keep passengers off the front platform. I went to Albany, and made an argument

against the proposed law, stating that the railroad company had absolutely no interest in it; that the law would not regulate the railroad company, but would regulate the public, and that if it was put into effect the practical effect would be that the public would be told that so many thousand of them must not go home until 9 o'clock at night, and they would at any rate have to delay their dinner. I suggested an amendment to the law which would cover the situation thoroughly, and that was a law compelling half of the passengers who desired to go north to turn around and go south, so that the carrying capacity of the cars would be adequate.

Mr. Dimmock: Have you not some law in regard to the crowding of the rear platform, so as to make it inconvenient for other passengers to get into the car.

Mr. Vreeland: There is no regulation, either municipal or State, on that question. We have, as you probably all know, the double door in New York City, which opens practically the full width of the rear platform, and we insist that our conductor shall not allow passengers to stand on the platform between the door and the side on which passengers are getting on, but that is not followed out very carefully. It is more a question of inches of capacity per foot on the car. I want to say, to show you how peculiarly we are situated in that respect, that the Board of Railroad Commissioners, with their inspector, came down last winter and looked that situation over thoroughly with reference to our Fourth and Madison Avenue line, and they said after their inspection: "We have nothing to recommend, and we do not see what you can do unless we say the people shall not ride. You are running as many cars as you can, and running them to the fullest limit during rush hours. You are running with regularity and dispatch, and doing everything you can to handle the people, and we must place ourselves in the position, not of saying to you what you shall do, but saying to the public what they shall do;" and, of course, in their own interest, they do not care to tell the public what it shall do.

Secretary Penington then read a resolution of thanks passed by the supply men to Ira A. McCormack for recommending to the executive committee resolutions for setting aside one day for the express purpose of inspecting the exhibits.

The secretary then read a telegram from D. B. Dyer, regretting his inability to attend the meeting.

Mr. Lang: Mr. President, I desire to offer this resolution:

Resolved, That the thanks of the American Street Railway Association be, and they are hereby tendered, to the several passenger associations, for having so kindly granted reduced rates to the members of this association and their friends who are in attendance at this meeting. Carried.

The President: It has been customary heretofore, as you know, to install the new officers on the forenoon of the last day of the convention, the banquet being held the night before. In consequence, the new officers have been installed in the presence of only a few members. The committee decided this year that it would be an interesting feature of the banquet to have the newly-elected officers installed at that time, and this will be done. When we now adjourn, therefore, we shall not adjourn until next year, but to be called to order at the banquet to-morrow night.

Mr. Vreeland: Before we adjourn I wish to be permitted to say a word. I regret that my engagements will compel me to return to New York this afternoon, and I desire to say that this is the first opportunity I have had since I have been connected with the street railroad business of attending a convention of this association. It has been exceedingly enjoyable to me, and I have made a good

many friends here, I think, by the expressions they have given me since I have been here. I have certainly been very much benefited by these proceedings, and, although Kansas City is a long way from New York, if I should happen to be in this country next fall—which I do not expect to be—I shall certainly call on Mr. Holmes, as a result of my visit here.

The meeting then adjourned.

The Banquet

It is well within bounds to say that the banquet on Friday night was one of the two or three within the remembrance of the oldest convention habitué which was without a flaw from beginning to end. It was held in the banquet hall of the Auditorium, which was beautifully decorated for the occasion, and the scene was a picture of light and color which has rarely been equaled at any previous banquet. The menu was good in itself, was served *hot* by skillful waiters, and was not too long drawn out to be tiresome. The menu cards were beautifully engraved with appropriate designs. The speeches were short, crisp and well handled, and the entire function was over at 11 o'clock, giving another hour for social chat in the parlors thereafter. Altogether, the banquet committee, the Auditorium management and the speakers, are to be heartily congratulated on the skill with which this more or less difficult gastronomic and oratorical combination was this year carried out.

A much appreciated courtesy at the banquet was the presentation to each lady present of a beautiful little basket of flowers, "with the compliments of the Christensen Engineering Company."

At the table of honor sat the retiring president, C. S. Sergeant, of Boston; the president-elect, John M. Roach and Mrs. Roach; Past President Albion E. Lang, of Toledo, and Mrs. Lang; President J. F. Calderwood, of the Street Railway Accountants' Association, and Mrs. Calderwood; Past President Robert McCulloch, now of Chicago, and Mrs. McCulloch; Mr. and Mrs. George A. Yuille; President-elect C. N. Duffy, of the Accountants' Association, and Mrs. Duffy; Hon. W. J. Hynes and Hon. W. E. Mason.

President Sergeant acted as toast-master, introducing the principal speakers in a very happy manner, without committing the grave mistake so often found at similar functions of "taking the wind out of the sails" of those who were to respond to the toasts. Mr. Sergeant's odd conceit of the American Street Railway Association banquet of the future as one in which, instead of the brilliant company now annually assembled, would appear but two jaded, careworn men meeting together, one representing all the street railways of the country in combination, the other, a trust of all the manufacturers, excited great laughter, and he further summarized the present situation by saying: "No longer does the representative of the supply company sit in the ante-room of the railway manager waiting for an audience, meanwhile, perhaps, casting his eyes upon some such notice as this: 'The purchasing agent will see persons having articles to sell on alternate Tuesdays, from 2 to 3 A. M. On the contrary, the offices of the rolling mills and car factories are filled with dignified directors of the street railway companies, soliciting the high privilege of placing orders for delivery (not guaranteed) in 1910.'"

Senator William E. Mason was the first speaker at the banquet, and his subject was "Chicago." It was full of wit and humor, with a serious undertone, however, which gave for dignity. Senator Mason was followed by James W. Duncan, who responded to the toast "Illinois," a name

which, he said, represented a territorial area so nearly the same as that described by the previous toast of "Chicago," as to leave little ground to stand on for one who followed "Chicago" with "Illinois." The pride of the State of Illinois in its distinguished citizens—Abraham Lincoln, U. S. Grant and John A. Logan—was eloquently voiced by Mr. Duncan, as were also the physical and commercial features which have given her so prominent a place in the American sisterhood of States.

The toastmaster next introduced J. H. Stedman, of Rochester, as the man who had the temerity to undertake to designate and identify the lady passenger by punching her picture upon the margin of a transfer—an undertaking which signally failed, because of the gallantry of the conductors in punching all ladies as "young." Retiring President Calderwood, of the Accountants' Association, was next called upon, and he read an original poem on the subject of "Grease." The final speech was made by W. J. Hynes.

At the conclusion of the regular speeches, President Sergeant, with a few graceful words, delivered his gavel, the emblem of presidential authority, to President-elect Roach, who accepted it, together with the duties and responsibilities of the presidency, in a little speech, in which he expressed the hope that in his term of office he might be able to serve the association and street railway interests as well as Mr. Sergeant had done.

Following Mr. Roach's installation as president *de facto*, in charge of the festivities, Third Vice-President-elect F. E. Jones, of the Memphis Street Railway Company, and Secretary Pennington were called upon for speeches, after which adjournment was taken to the parlors for a final hour of social enjoyment.

The Entertainments

On Wednesday afternoon a special train arranged for by the entertainment committee conveyed nearly 500 of the convention attendants to Lockport, Ill., the terminus of the main drainage canal of the sanitary district of Chicago, and at several points on the outward journey the train was stopped to permit inspection of this, Chicago's largest and most magnificent engineering work. It is probable that the immensity of this achievement could be realized by but few, if any, of the party, partly through lack of knowledge of the conditions which make such a work necessary, and partly because there is little in the neighborhood of the canal by which to gage its really enormous size. Figures also are of little value at such a time, but when it is stated that the necessary excavations involved in the entire work will be about equivalent to the removal of a layer about 3 ft. deep from the entire surface of Manhattan Island south of 125th Street, and that the entire cost of the work is estimated to be between \$40,000,000 and \$50,000,000, it will be seen how courageous is Chicago's spirit in grappling with so tremendous an undertaking. While the present plans do not involve, as some suppose, the construction of a ship canal from the lakes to the Mississippi River, it is true that there will be a continuous waterway which may eventually be developed into a ship canal.

Perhaps the greatest of the industrial enterprises of Chicago is the slaughtering of animals and the preparation of food products. This is one of the most highly organized industries to be found in the world, the division of labor and the introduction of labor-saving machinery being carried to their highest development. It was natural, therefore, that a visit to the famous Union Stock Yards of Chicago should be on the programme prepared by the committee on entertainment, and this excursion took place

on Thursday afternoon. It had been intended to allow the attendants a liberty of choice between the stock yards and a tally-ho excursion through Jackson Park, but the weather was so raw and unpleasant that a change in programme was made, by which those who chose to do so rode to the stock yards in the tally-hos and returned through Jackson Park, the others going by trolley cars. The stock yards made a great impression upon the delegates, because of the wonderful system of handling the business seen there and the perfect cleanliness of all the processes.

On Friday, carriage parties to the principal stores, the Art Institute and Lincoln Park, were made up for the ladies in attendance, and the merchants of Chicago, particularly such concerns as Marshall, Field & Company, who own the greatest dry-goods establishment in the world, were doubtless the richer by many thousand dollars for this feature of the programme.

On Friday afternoon also a special excursion to the power station of the South Side Elevated Railway Company was made, upon invitation, and under the charge of the Westinghouse Electric & Manufacturing Company. A special train, kindly furnished by the South Side Company, left its office at 2:30 P. M., and about 100 were in the party. The station is equipped with four 800-kw. Westinghouse generators and two new 1500 Westinghouse generators are being erected at the south end of the station. Other apparatus represented in the station were the boilers of the Babcock & Wilcox Company, the economizers of the Green Fuel Economizer Company, the engines of the Edward P. Allis Company, the auxiliary steam apparatus of the Wheeler Condenser & Engineering Company, and S. J. McLeod.

The reception given in the Auditorium parlors on Tuesday evening by the entertainment committee and many ladies of Chicago was a *conversazione*, enlivened by music and refreshments, but with little dancing. Its object was to place the delegates and their Chicago friends on an immediate social footing, as well as to renew old convention friendships of many years' standing. Chicago's hospitality proved very warm and cordial, indeed. The reception was wound up by an impromptu concert, in which the Auditorium piano and several score of voices—soprano, alto, tenor and bass—took part, the soprano and alto gradually dropping out as evening passed into morning, until at length was left only the hoarse croakings of an occasional *basso profundo* reverberating from the marble walls of the Auditorium subway, and finally losing itself in the Turkish room or in long-neglected chambers.

Several private dinner parties at the Chicago clubs and in the hotels formed enjoyable features of the convention, and the absence of an iron-bound, rock-ribbed programme of entertainment made these special gatherings possible and most enjoyable. Right here, the action of the local entertainment committee in laying out its programme of social functions ought to be especially commended, in that so large latitude of choice was left to those in attendance at the conventions in the matter of entertainment features, particularly in the evenings. Wednesday evening, for example, was entirely free, while on Thursday evening those who cared to do so were privileged to make up theater parties to see "His Excellency the Governor," for which nearly the entire house had been secured by the entertainment committee for delegates and their friends. Many of those who attend the conventions have friends in the convention cities, for seeing whom they wish to reserve time, and where the entertainment is practically a "continuous performance" it is difficult to break away, unless, as in this case, optional features are introduced on one or more evenings.