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Railway Association and Its Affiliated Associations

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## President Shaw's Address

The address of President Shaw delivered yesterday was followed with close attention by those present. While longer than those customarily presented at annual meetings of the associations it would be difficult for even the most captious critic to suggest a place where it could have been shortened. Logically, it can be divided into three parts; (1) A brief statement of the reasons for meeting at Denver; (2) A discussion of national issues and of the conditions of the industry at large; (3) The condition of the association. Each of these demanded attention and the remarks on each give food for thought.

The first part of Mr. Shaw's address contains a reference to the interest taken in association matters by the officials of The Denver City Tramway Company and its predecessors which teaches a lesson. There may be some companies in the East which can furnish as good a record for attendance at conventions as that of Denver, but there are not many. None, we believe, can show such a performance in distance traveled to attend meetings of the associations. It was certainly a duty which the association owed its loyal Western members to hold a convention nearer their home than has been done during the past 27 years, and it is equally a duty not to let so long a time elapse before re-visiting the far West.

The significant remarks of President Shaw on the conditions of the industry and on national issues cover so wide a field as to preclude detailed consideration here, but they are all worthy of the most careful thought. His comments, especially, on the income and corporation tax, awakened the greatest interest, while his remarks on the favorable finan-

cial condition of the association were received with applause.

In his analysis of the affairs of the association, President Shaw touched upon a subject which is, of course, of the greatest interest to every delegate who had the privilege of listening to it. Often in years past the question has been asked: "Of what value is the association and is it increasing or decreasing in usefulness?" These questions have been raised less frequently in recent years by those who are acquainted with the work of the association, but it is perhaps only natural that since the establishment of a New York office by the association, and especially this year, on account of the length of the trip to Denver for most companies, they should have been asked by some in elucidating these points. President Shaw took occasion to review briefly the history of the association, and showed that while it has had its fluctuations of prosperity and membership, the progress has always been consistently forward. During the last year it has gained greatly in both active and associate membership, as well as in value of the work accomplished, and the goal set of 750 active members and 5000 associate members does not seem so impracticable as it might have two or three years ago.

## Report of the Committee on Education

The ideal professional man, whether he is a lawyer, physician or engineer, knows thoroughly both the technical, or scientific, and the practical side of his calling. Experience has shown that he can learn either first, but that he cannot be considered fully informed in his chosen field until he has acquired a knowledge of both sides of his work. If he begins with the practical side, he should later acquire a knowledge of the underlying laws which control the phenomena which he has already learned to understand. If he elects to learn these principles first, he must subsequently become conversant with their practical application.

The committee on education was appointed to determine the best method of developing men for the higher positions in the electric railway service, and its report last year was devoted to outlining a course by which the technical graduate could study in the school which is taught by experience. As a result it recommended the establishment of individual apprenticeship courses, which since have been inaugurated by several companies. Its report this year gives some particulars of the results secured by the adoption of this plan by several companies, but is devoted principally to the second phase of the work, that of making the practical man technical. To this end, it suggests a correspondence course somewhat along the line followed by the American Gas Light Association, which has already been described in these pages, and was mentioned by Professor Norris last year.

There may be a difference of opinion as to which method should be most productive of good, but there can be none that each is necessary, if all of the available human material which will be required by the electric railways of the country in the future is to be utilized. All of the most successful generals of the army have by no means been graduated from West Point, nor could all of the most prominent admirals in this country claim Annapolis as their alma

mater. Natural ability is bound to assert itself, and it is not only a duty which the railway companies owe to their men to give them the opportunities which they need for self-improvement, but it is obligatory on them to offer avenues of advancement equal to those in other lines of industry, if the electric railways expect to attract men of ability to their employ. It may be argued that the establishment of apprenticeship and instruction courses involves considerable labor and some expenditure of money, and that little benefit is derived if, after a company goes to the trouble of educating a man, he leaves its employ and enters that of another road. This is a risk which must be taken in every business. But if the work is conducted primarily by the association, individual loss in cases of this kind is limited, and what one company loses, another gains. Moreover, it is safe to say that while some men are afflicted with a wanderlust, most would prefer to remain with a company with whose methods they are familiar, unless there is considerable inducement to change.

The number of college professors on the committee on education makes the third of its conclusions particularly interesting; namely, "that by adopting the educational process, the companies will produce a reflex action upon the schools and will influence them in improving their methods." This growing community of interest between the schools and the practical business is a very healthful sign. It is only within a few years that the representatives of the leading educational institutions of this country have considered it worth their while to attend railway conventions. Up to that time neither the colleges nor the railway companies thought they could secure much, if any, benefit from the other, but the bond of connection between theory and practice is growing closer, as it should, and as the colleges are becoming better acquainted with the needs of the companies, so the latter are adopting methods more closely approximating university standards. In fact, there is a general acceptance of the doctrine that each is a proper complement of the other.

### Mr. Gonzenbach's Paper

The phase of Mr. Gonzenbach's paper which elicited the greatest discussion was where he advocated a scientific organization for a small road, rather than a "one man" management. As he truly said the latter may for a considerable time be the easier and cheaper, but if the "one man" suddenly becomes incapacitated the chances are that the resulting loss will be greater than if each important official had been training a subordinate to assume the more important of his own duties in case of emergency. Another point emphasized in the paper was the value of the training in electric railway operation, afforded by service on a small road. Possibly some of his views on this point would hardly be considered orthodox by the colleges. Nevertheless, there is no doubt that the man on the small electric railway who is thrown on his own resources will develop ingenuity if he has any to speak of; and as successful electric railroading consists very largely in the solution, not of old problems, but of constantly recurring new ones, the man with resources will win out where he who depends entirely on routine will fail.

One application of this truth lies in the recognition of ability to carry out successfully a definite task, rather than mere experience. A man who has "made good" in one department of a company, has organized his forces to carry on the work assigned to him and has conducted what has been given him to do efficiently and economically, is often as good a man, if not better, as the head of another department with a more responsible position, than an outsider. The latter may have a reputation for having accomplished certain results under certain conditions but his ability to do as well under entirely different conditions has not

been demonstrated, and he certainly is less acquainted with the system and the public with which he will have to deal than the successful chief of the subordinate department.

### Report of the Committee on Way Matters

The report of the committee on way matters is devoted this year entirely to the subject of rails, their section and composition, although a large variety of phases of these two topics is considered. No change is made in the standards recommended for grooved or girder rails, but a slight change is suggested in the form of the 7 in. T-rail recommended by the committee as standard for heavy service in paved streets. In this connection the committee takes occasion to recommend strongly the use of T-rails in paved streets, except in cities of the largest class where a dense vehicular traffic makes the use of a flanged rail advisable.

The question of material is next considered. Only thirteen companies of those reporting have tried open-hearth rails, but the results secured on steam roads and abroad from rails of this process of manufacture have been such as to recommend their adoption to the committee.

The use of open-hearth steel instead of Bessemer steel for rails is comparatively new in this country and its marked superiority for high T and girder sections, according to several speakers, is still to be demonstrated. The demand for it began about two years ago when the steam railroads became alarmed over the increasing number of breakages of rails, and the open-hearth process was recommended in quarters as a possible means of improvement. As a result some quarters as a possible means of improvement. As a result of the agitation for better rails the steel manufacturers were practically forced into changing their process of making rail ingots for the most part from Bessemer to open-hearth. The demand for open-hearth T-rail from the steam roads has led to a demand for open-hearth girder rails also. The Bessemer process is especially suitable for making low-carbon steel, but it is generally acknowledged that the open-hearth process produces steel of more uniform composition throughout each heat. It is also easier to control the uniformity of chemical composition of several successive heats in the open-hearth furnace. The causes of failure of steam railroad rails are usually segregation, which causes brittleness, or inherent flaws due to pipes in the ingot from which the rail was rolled.

Under the heavy axle loads of steam railroad practice rails break due to the stresses produced in them when acting as a beam, and also to the shock of impact. Flaws or brittleness are fatal to the life of rails in this service. In street and interurban railway track, however, the conditions are entirely different. The extreme axle loads are less than 15 tons as against 22 to 25 tons and in heavy girder rails the unit stresses for the same imposed load are less, owing to the larger section modulus. Street railway rails wear out by abrasion before they break. The principal advantage if any, of the open-hearth process over the Bessemer process for girder rail would seem, therefore, to be the possibility of producing uniform steel with a high carbon content and good wearing qualities. The difficulty of rolling complex girder rail sections in high carbon steel is recognized by all metallurgists and as eminent an authority as Dr. C. B. Dudley of the Pennsylvania Railroad long ago pointed out the desirability of keeping the carbon within reasonable limits.

One electric railway company only of those reporting has used manganese rails in places other than in special work. No results are given, but the use of the rail for straight track is so new that the specifications given by the committee for manganese rails will attract attention. The report concludes with a mathematical discussion upon the design of the grooves in rails and of the proper track gage for curves.

## CONVENTION PROGRAM FOR TODAY

## American Association.

(AUDITORIUM HALL.)

2 P. M. to 5 P. M. (Executive Session.)

Appointment of Nominating Committee.

Reports of Committees.

- (a) Interstate Commerce Commission Affairs.
- (b) Compensation for Carrying United States Mail.

## Accountants' Association.

(SAVOY HOTEL.)

9:30 A. M. to 12:30 P. M.

Convention Called to Order.

Annual Address of President.

Annual Report of Executive Committee.

Annual Report of Secretary-Treasurer.

Paper—"Interurban Statistics," by S. C. Rogers, Treasurer and Secretary, Mahoning &amp; Shenango Railway &amp; Light Company, Youngstown, Ohio.

Report of the Committee on Interline Accounting.

Appointment of Convention Committees.

Appointment of Nominating Committee.

New Business.

1 P. M.

"Get-together Luncheon." (Place to be announced at Wednesday morning session.)

## Engineering Association.

(ROSE PARLOR, AUDITORIUM BUILDING.)

9:30 A. M. to 12:30 P. M.

Report of Committee on Equipment.

2 P. M. TO 5 P. M.

Report of Committee on Power Generation.

Appointment of Nominating Committee.

## Claim Agents' Association.

(METROPOLE HOTEL.)

9:30 A. M. to 12:30 P. M.

Discussion:

The Unreported Accident; Its Evils and Remedy.

General Business.

Reports of Convention Committees.

Report of Nominating Committee.

Election of Officers.

Installation of Officers.

Adjournment.

## Transportation and Traffic Association.

(AUDITORIUM HALL.)

9:30 A. M. to 12:30 P. M.

Appointment of Committee on Nominations.

Report of Committee on City Rules.

Report of Committee on Transfers and Transfer Information.

Paper—"Transfer Laws and Suggested Changes," by Arthur A. Ballantine, Boston, Mass.

Paper—"Chicago's Transfer Crusade," by Joseph V. Sullivan, General Supervisor, Chicago Railways Company, Chicago, Ill.

## Transportation and Traffic Association.

(AUDITORIUM HALL.)

9:30 A. M. to 12:30 P. M.

Unfinished Business.

Report of Committee on Training of Transportation Employees.

General Business.

Report of Nominating Committee.

Election of Officers.

Installation of Officers.

Adjournment.

## Conventionalities

And to think that this magnificent exhibition of electric railway machinery and appliances is only for a week!

Like Chicago and other cities, Denver is planning a "civic center." The city issues a weekly paper, Denver Municipal Facts, and that tells all about the project.

George Stanton of the Cleveland Frog & Crossing Company is on hand, of course. Would the convention be complete without him? It would not!

One member of the old guard who is attending this convention is E. S. Goodrich, formerly president of the Hartford Street Railway Company, of Hartford, Conn. Mr. Goodrich was on the special train from Boston.

The Brooklyn Rapid Transit Company is represented at the convention by C. E. Roehl, electrical engineer; W. G. Gove, superintendent of equipment, and C. L. Crabbs, engineer of way and structure.

C. H. Morse and W. F. R. Mills, president and secretary, respectively, of the Denver Convention League, have won deserved praise for their painstaking efforts to make provision for every need of the large number of visitors.

The traction interests of Rochester and vicinity are well represented by W. R. W. Griffin and J. C. Collins, respectively general superintendent and secretary-auditor of the Rochester Railway Company; H. R. Martin, claim agent of the Buffalo, Lockport & Rochester Railway Company, and J. H. Stedman, the transfer man.

H. T. Edgar, manager of the Northern Texas Traction Company, Fort Worth; H. S. Potter, general superintendent of the El Paso (Texas) Electric Railway Company, and K. C. Schluss, superintendent of power of the Puget Sound Electric Railway, are three Stone & Webster men who apparently have to watch one another, for they keep together pretty closely.

The United Railways & Electric Company delegation from Baltimore is composed of the following gentlemen, who are staying at the hotels mentioned: N. E. Stubbs, auditor, Savoy; James R. Pratt, assistant general manager, Metropole; W. C. Ludwig, superintendent of transportation, Albany; A. T. Clark, acting superintendent, Adams.

How does Dubuque get along while L. D. Mathes, manager of the Union Electric Company of that city, is in Denver? Mr. Mathes knows more ways to cook a prairie chicken than any other man in the Mississippi Valley, but at present he is a little downcast because of the year's record of the Dubuque baseball club.

The Sioux Falls (N. D.) Traction Company has distributed at the convention copies of its paper published every little while under the title of "On The Cars." It is a cleverly edited sheet and serves as the official organ of the company. It contains information about the schedules of all the lines in Sioux Falls and many items of local news.

The friends of James Rawle, president of The J. G. Brill Company, and of S. M. Curwen, vice president of the same company, will regret to hear that their absence from this convention is due to deaths in their families. Both Mr. Rawle and Mr. Curwen have been familiar figures at the street railway conventions in years past, and their absence will be noticed.

A. W. McLimont, who rejoices in the titles and emoluments of treasurer, general manager and purchasing agent of the Chicago & Milwaukee Electric Railroad Company, is a most interested spectator and participant at the convention. Mr. McLimont was formerly electrical engineer of the New York Public Service Commission, District No. 1, in which position he was expected to go gunning without mercy after those bad, bad railway fellows. He is now one of the

hunted himself, but he doesn't seem to mind it. Apparently his experiences in South America and New York have inured him to almost anything.

H. G. McConnaughy of New York is one of the most active and energetic members of the exhibit committee. He seems to be ubiquitous.

Among the delegates from Philadelphia are noted the cheerful faces of F. H. Lincoln, assistant general manager, and W. S. Twining, chief engineer, of the Philadelphia Rapid Transit Company.

Just fancy one of those bright Denver reporters wandering around with a claim agent's badge! If it had not been for the eagle eye of Secretary Davis, who can spot a claim agent at 150 paces, said reporter might still be "among those present."

Who has the newest thing at the convention? He would be a rude man who attempted to answer that question, but the Dearborn Drug & Chemical people are distributing freely a little souvenir which is so new that it relates entirely to the future.

L. P. Sawyer, of Buckeye fame, arrived Tuesday morning from Cleveland. He was busy all day receiving the congratulations of his friends upon the recent arrival of "Sorry Junior." Ask him to tell you about the tantalum lamps on the Denver cars.

If there is a busier man at the convention than George Keegan, secretary-treasurer of the Manufacturers' Association, he will have to "go some." Mr. Keegan is the guide, philosopher and friend of the supply men—the chaps with the red badge of courage.

Texas is the Lone Star State, and, perhaps, that is the reason why the C. A. Wood Preserver Company of Austin is the only member of the Manufacturers' Association in that State. Herman F. Gebhard is the star who is representing that company at the convention.

Two of the big Iowa men of the convention—with the accent on the "big"—are F. J. Hanlon of Mason City, otherwise known as "the Little Cupid of Clear Lake," and P. P. Crafts of Clinton, respectively ex-president and president of the Iowa Street & Interurban Railway Association.

H. H. Polk, of Des Moines, is a pretty busy man managing his father's extensive estate, which owns among other things, a controlling interest in the Des Moines city and interurban lines. But when the lure of the convention was combined with the charms of Denver, he couldn't resist the call, and he came in the Iowa special.

The Westinghouse Companies are distributing through their bureau of publicity their regular annual diary for 1910, containing the usual amount of technical information for electrical and mechanical engineers; also a handy loose-leaf memorandum book. If you have not received one of these souvenirs ask for it at their booth.

Guides have been stationed at the power house, shops and car houses of The Denver City Tramway Company, who will take pleasure in showing visitors around. A cordial welcome is extended to all convention people. The office of S. W. Cantril, superintendent of transportation, is at "Central Loop," Fifteenth and Arapahoe Streets, and here, too, visitors are made welcome.

F. G. Bolles, in charge of the large Allis-Chalmers exhibit, is no novice in convention matters. Those who attended the Cincinnati convention of the National Electric Light Association several years ago will remember many courtesies extended at Norwood and elsewhere. Mr. Bolles is now commercial engineer of the Allis-Chalmers Company, with headquarters in Milwaukee.

Don't forget that the "Wishbone" sightseeing trip for the ladies comes this afternoon. This is a 51-mile trip in trolley cars "seeing the foothills." Cars will leave the Brown Palace at 2 o'clock. This is said to be the best short trip

around Denver. A stop will be made at Golden, formerly the State capital, where the School of Mines will be inspected. The return trip will terminate at the "White City" barbecue. W. K. Beard, of the *Electric Railway Journal*, is the member of the entertainment committee in charge of the trip.

Numerous side-trips and after-trips are being arranged. A. G. Thornley, general manager of the Consolidated Fender Company of Providence, R. I., for instance, is anticipating an exceptionally pleasant time after the convention. Together with Mrs. Thornley he will go to the Pacific Coast and Seattle on the special tourist train organized by Charles S. Clark of the Boston & Maine Railroad.

A surveying party engaged in running lines between Denver and Pueblo on the Colorado Southern railroad, visited the convention halls on Monday. There were 17 in the party, among whom were D. S. Hooker, George F. Bidwell, Jr., Richard Bennett, Frank Egan, C. W. Saunders and Ezra M. Stutzman. The party came to Denver from Colorado Springs where the engineering corps is now located.

Major H. C. Evans of the Lorain Steel Company is not a stranger in Colorado. He formerly lived in Aspen, in Pitkin county, and he proposes to visit his old home before he returns to the East. He probably will not find many familiar faces, for at the time Major Evans was a resident of the State, 27 years ago, he and six other men who were prospecting for gold in the Gunnison country were about the only white men in the neighborhood.

The executive committee of the Manufacturers' Association meets daily at 12 o'clock at the entrance headquarters for the purpose of settling any matters in relation to exhibits that require attention. Careful and prompt attention is paid to any complaints or complications needing adjustment. Great credit is due to President Joseph R. Ellicott, Secretary George Keegan and Director of Exhibits K. D. Hequembourg for the efficient manner in which all business in connection with the exhibits is handled.

Somebody discovered Atkin looking longingly at the Rocky Mountains, and it turned out that he was trying to figure out some way of sailing his yawl among them. By Atkin is meant Godfrey H. Atkin, manager of the Chicago office of the Electric Storage Battery Company. Accompanying him are Mrs. Atkin and H. B. Marshall, manager of the St. Louis office, and R. L. Lunt and G. H. Morris of Chicago. Mr. and Mrs. Atkin will go to Colorado Springs after the convention, and stop in Kansas City on their way home.

J. McMillan, general manager of the Pacific Electric Railway and the Los Angeles-Interurban Railway, arrived on Tuesday. His system is one of the largest in the world. It operates over 600 miles of interurban track and has a magnificent twelve-story terminal building of which the company is justly proud. Mr. McMillan arrived with a cinder in his eye; an oculist had failed to remove either. The exhibits made Mr. McMillan open his eyes so wide the cinder fell to the ground, and the result was instantaneous relief.

There was some doubt as to whether the convention would be up to former standards until the arrival of W. Worth Bean of Benton Harbor, Mich. Mr. Bean holds the unique record of having attended every street railway convention, including the organization meeting in Boston in 1882. The present convention, therefore is the twenty-eighth which he has attended. He is very well pleased with the appearance of everything and says that the Denver convention is as good as any of the others. Since his sale of the St. Joseph & Benton Harbor Electric Railway several years ago Mr. Bean has not been actively engaged in electric railway work, but he is just as interested as ever in all improvements and developments. His many friends hope that he will attend the convention for many years to come.

## TUESDAY MEETING OF THE AMERICAN ASSOCIATION

The first session of the American Street & Interurban Railway Association was called to order by President James F. Shaw at 2:30 p. m. on Tuesday, Oct. 4, in the Auditorium Hall. The first order of business was the presentation of the annual report of the executive committee. The report was read by Secretary Bernard V. Swenson, and upon motion of E. C. Foster, New Orleans, was accepted.

### Report of the Executive Committee

The report of the executive committee consisted of the minutes of meetings of the executive committee on Oct. 15, 1908, Jan. 29, 1909, the report of the secretary to the executive committee at that meeting and the minutes of the meeting on Oct. 4. The main facts of the meetings held previously to that in Denver were published at the time in the *Electric Railway Journal*. At the meeting yesterday the committee formally approved the papers presented at this convention and also passed a resolution extending its thanks to the Manufacturers' Association for the badges presented to past presidents of the American Association. A discussion then followed concerning the advisability of the appointment of a committee on general policy to consider the work of the association as a whole and the president was requested to appoint such a committee, consisting of three members of the executive committee, with instructions to report the results of its deliberations before the close of the 1909 convention. The secretary submitted a list of the changes in the membership of the association since his last report. The committee adopted as an official seal that portion of the design of the badges presented to the past presidents enclosed within the wreath.

The following rules governing registration for future meetings were then adopted:

(a) Associate membership registration at the convention is primarily for those who cannot register either as delegates of member companies or as representatives of the Manufacturers' Association.

(b) Associate members who belong to member-companies should register as delegates of their respective companies.

(c) Associate membership in the American Street & Interurban Railway Association does not carry with it any commercial privileges incident to the convention. All associate members who derive such benefits from attendance at the convention should pay their dues to the Manufacturers' Association and obtain manufacturers' badges.

(d) All associate members should register at the Railway Association booth and receive an associate member's convention emblem.

(e) Associate members' convention badges will be given only to those associate members who cannot register as delegates in one or another of the various associations.

President Shaw then said that the success of the meeting in Denver was in no small sense due to the untiring efforts of the local reception committee and the Denver City Tramway Company, of which William G. Evans was chairman and president respectively. He then introduced Mr. Evans.

Mr. Evans thanked the delegates for the greeting and expressed the heartiest welcome he could on behalf of the Denver company and the hope that the convention would be a satisfactory one. They were tremendously pleased at the magnificent exhibit made here by the manufacturers. It was the finest exhibit they had seen in Denver.

The annual report of the secretary and treasurer for the period from Oct. 1, 1908, to Sept. 24, 1909, was then read by B. V. Swenson, secretary, and accepted. An abstract follows:

### Report of the Secretary and Treasurer

In presenting this, the fourth annual report of the secretary-treasurer since the reorganization of the association, it has seemed wise to make a somewhat general report of the work which has been accomplished during the past year, and to follow this up by a more detailed report, showing the exact status of the membership and finances at the close of the fiscal year. Much additional information, some of it statistical, relative to the association work during the past year is contained in the address of the president.

### General Report

Immediately after the close of the last convention, the work of placing the 1908 proceedings of the different associations in book form was pushed as rapidly as possible with the result that paper-covered copies of the reports of the various affiliated associations were completed and sent to the member companies before Jan. 1, 1909, and the cloth-bound copies of the proceedings were ready for distribution on Jan. 20 last.

The 1908 proceedings are the first to contain an annual report of the Transportation & Traffic Association, which was organized in January of that year. In addition to several new lines of work, this association has taken over practically all of the general and more public work heretofore done by the American Association, and the annual proceedings of the latter are practically confined to member company matters.

As all associate members this past year have been furnished with cloth-bound copies of the proceedings of both the Engineering and the Transportation & Traffic Associations, the reports of these two associations have been bound together and constitute Volume 1 of the 1908 proceedings. The Accountants' and Claim Agents' Association proceedings have, as in past years, been bound together and constitute Volume 2. The American Association proceedings are bound separately in Volume 3.

Five hundred paper-covered copies of the reports of each of the four affiliated associations were printed, and one copy of each of these reports was sent to each member company. In addition, there were printed 2000 cloth-bound copies of Volume 1, and 1250 cloth-bound copies of Volume 2. The excess number of copies of Volume 1 were for distribution among associate members. The number of copies of Volumes 1 and 2 supplied to each member company, was in proportion to the amount of annual dues paid by the company, the distribution being made upon the same basis as in previous years.

As the American Association proceedings are primarily of interest to the higher officials under the new condition of affairs, only 750 copies of Volume 3 were printed, and these were all bound in cloth. Each member company was supplied with one of these books.

The action taken by the president and secretary in the matter of binding and printing the 1908 proceedings, and in the method of their distribution, was duly approved by the executive committee at the January meeting.

During the past year the office of secretary-treasurer in each of the four affiliated associations has been purely honorary with no salary attached. It will be remembered that the Accountants' Association made this change at the 1907 convention, and that the Transportation & Traffic Association started out in this way. The Engineering and Claim Agents' Associations continued on the old basis up to the 1908 convention, but the change became effective with the beginning of the year just closed.

Shortly after the close of the 1908 convention your president took active steps toward increasing the membership in the association by the appointment of two large and comprehensive committees, one on active membership and the other on associate membership. These committees have done a vast amount of work during the year, and the results have been most gratifying. The reports of these committees will be presented at this meeting and will show more in detail the manner in which the work was carried on. The results obtained are shown in complete detail in the latter part of this report.

At the 1908 convention the association adopted an official pin or emblem to be worn by associate members. Soon after the close of the convention the executive committee of the Manufacturers' Association very generously volunteered to supply the association with 1,000 of these pins in solid gold and blue enamel, similar to the original design. This offer was accepted and a vote of thanks was extended to the Manufacturers' Association by the executive committee at its January meeting. These pins have been sold by the secretary for the sum of \$3 each, which amount covers their original cost and the postage; this money going into the treasury of the American Association. Over 375 of our associate members are wearing this pin. It has been found that the official emblem has been an important factor in the large increase in associate membership this year, and there is no question but that it will have an even more important bearing upon associate membership in the future, not only in the matter of increasing such membership, but also in making it more stable and permanent.

The executive committee at its January meeting decided that the convention this year should be held in some city west of the Mississippi river, and appointed a Convention

Location Committee to take this matter in charge, with power to act in the selection of the time and place for holding the convention. While several other cities west of the Mississippi river were considered, the committee was of the opinion that the convention should be held in Denver, if satisfactory arrangements could be made, not only so far as the American Association and its affiliated organizations were concerned, but also from the standpoint of the Manufacturers' Association. A conference to decide this matter was held in Denver on April 19, 20 and 21, at which our Convention Location Committee was represented by John I. Beggs, E. C. Foster, A. E. Lang and B. V. Swenson. The Manufacturers' Association was represented by J. R. Ellicott, C. C. Peirce, J. H. McGraw and George Keegan.

After a conference lasting three days, an agreement was reached between the Denver people and the representatives of our associations, and it was decided that the 1909 convention should be held in Denver.

At the January meeting of the executive committee the secretary, because of his desire to enter into other business relations, tendered his resignation to take effect on that date, or as soon thereafter as would be practicable from the standpoint of the association work. By vote of the executive committee this matter was left to the president and vice-presidents of the association, and an arrangement was made at that time whereby the present secretary would devote such a portion of his time as might be necessary to the association work until his successor was appointed and installed in office. The thought then was that this would be but a temporary condition of affairs lasting two or three months at the most, but no change was made up to the close of the fiscal year. While the association work has been carried along in a most excellent and effective manner during the past seven months, the results obtained have been due in large measure to the great amount of time and thought devoted to this work by President Shaw, personally, and to the untiring efforts and most loyal support which the secretary has received at all times from H. C. Donecker, the office manager of the association. While such an arrangement might be temporarily effective, and even over a period of several months, it is essential to the welfare of the association that, with the beginning of the new year, a secretary and treasurer be appointed who will devote his entire time and energy to its work.

In addition to the various important features of the association work of the past year, some of which have been previously mentioned, and others of which are considered in the address of the president, may be mentioned the many important committee meetings which the American Association and its affiliated associations have held at various times during the year, a number of them at the New York headquarters. The results of the work of these committees are shown in the many valuable reports which will be presented at the different sessions of the various conventions this week.

In the following pages of this report will be found complete information concerning the present status of both active and associate membership and the financial statement showing the receipts and expenditures for the period from October 1, 1908, to September 24, 1909, both inclusive. A supplemental report will be presented at the convention by the secretary, covering the last six days of the fiscal year.

**Capitulation of Associate Members, Sept. 24, 1909.**

Associate members, Oct. 1, 1908 (see 1908 Proceedings, Vol. 3, page 86) .....	249
Resigned .....	8
1909 dues unpaid .....	33
<hr/>	41
Total 1908 members in good standing Sept. 24, 1909 .....	208
1906-1907 associate members reinstated .....	4
Delinquent .....	1
1906-1907 associate members reinstated in good standing .....	3
<hr/>	
Total old associate members in good standing .....	221
New association members .....	596
<hr/>	
Total associate membership, Sept. 24, 1909 ..	807*

\*The cash statement shows 805 payments of associate membership annual dues. This is made up as follows:  
 1909 dues from 1908 associate members in good standing, Oct. 1, 1908 ..... 198\*  
 1908 dues from old associate members delinquent at Oct. 1, 1908 ..... 4  
 1909 dues from old associate members delinquent at

Oct. 1, 1908 .....	3
1909 dues from new associate members .....	596
1910 dues paid by old members in addition to paying 1909 dues .....	4
<hr/>	
Total payments of dues of all kinds .....	805

\*The capitulation shows 208 1908 members in good standing; ten of these paid 1909 dues in September, 1908, making 198 paid during this year.

**Capitulation of Active Members Sept. 24, 1909.**

Active members, Oct. 1, 1908 .....	262
1909 dues unpaid .....	11
Resigned .....	14
<hr/>	25
Total 1908 active members in good standing ..	237
Active members reinstated during period from Oct. 1, 1908, to Sept. 24, 1909, inclusive, by payment of 1908 dues .....	13
Withdrawn .....	2
<hr/>	
Total reinstated active members in good standing .....	11
Total old active members in good standing ..	248
New active members admitted during period from Oct. 1, 1908, to Sept. 24, 1909, inclusive ..	63
1909 dues unpaid .....	7
<hr/>	
New active members in good standing, Sept. 24, 1909 .....	56
Total active members in good standing, Sept. 24, 1909 .....	304

**Cash Statement.**

**Receipts.**

(Period from Oct. 1, 1908, to and including Sept. 24, 1909.)

Cash in bank, Oct. 1, 1907 .....	\$3,365.24
Engineering Association cash balance from secretary-treasurer .....	\$ 0.62
Admission fees .....	620.00
Company annual dues .....	26,420.00
Associate membership dues .....	4,025.00
Interest on bank deposits .....	138.88
Sale of annual reports .....	240.75
Sale of rule books .....	47.00
Sale of standard classification of accounts .....	46.40
Sale of associate membership badges ..	1,101.00
Sale of pamphlet "The Fare Question" ..	69.05
Sale of report of Standardization Committee .....	11.25
Portion of cost of reporting conference of committee on Interurban Rules paid by technical press .....	59.00
Account location of convention in Denver, Colo. ....	5,000.00
Exchange .....	.90
<hr/>	
Receipts during period ending Sept. 24, 1909 .....	37,779.85
Total cash, including balance of Oct. 1, 1908 .....	\$41,145.09

**Expenditures.**

(Period from Oct. 1, 1908, to and including Sept. 24, 1909.)

Salaries .....	\$9,008.33
Printing and stationery .....	2,989.49
Postage .....	1,633.91
Miscellaneous office expenses .....	383.59
Rent of office .....	2,700.00
Telephone, telegraph and messenger .....	465.15
Express, freight and cartage .....	180.16
Traveling expenses, secretary .....	819.70
Traveling expenses, other committees .....	342.05
Miscellaneous general expenses .....	901.71
Associate membership badges .....	22.00
1908 convention .....	461.43
Annual report, 1908 .....	1,214.13
Furniture and equipment .....	449.45
Accountants' Association .....	(a) 1,614.88
Engineering Association .....	(b) 3,387.56
Claim Agents' Association .....	(c) 1,271.74
Transportation and Traffic Association .....	(d) 3,105.87
<hr/>	
Total expenditures, period ended Sept. 24, 1909 ..	30,951.15

(a) Proportionate cost of 1908 proceedings and advance papers, \$736.50; account of appropriation, \$878.38.  
 (b) Proportionate cost of 1908 proceedings and advance papers, \$1,717.98; account of appropriation, \$1,669.58.

(c) Proportionate cost of 1908 proceedings and advance papers, \$916.44; account of appropriation, \$355.30.

(d) Proportionate cost of 1908 proceedings and advance papers, \$1,437.80; account of appropriation, \$1,668.07.

Recapitulation.

Cash on hand, Oct. 1, 1908 .....	\$3,365.24
Receipts during period from Oct. 1, 1908, to Sept. 24, 1909 .....	37,779.85
<b>Total cash .....</b>	<b>\$41,145.09</b>
Expenditures during period from Oct. 1, 1908, to Sept. 24, 1909 .....	30,951.15
<b>Balance on hand Sept. 24, 1909 .....</b>	<b>\$19,193.94</b>

**Metropolitan Bank.**

New York, Sept. 25, 1909.

American Street & Interurban Railway Association, New York City:

Gentlemen.—We beg to advise that at the close of business Sept. 24, 1909, the balance to the credit of your Association on our books was \$11,448.16.\*

Yours very truly,

(Signed) A. C. CORBY, Cashier.

\*Deducting checks outstanding to the amount of \$1,254.22, makes the correct balance of \$10,193.94 as shown in cash statement.

Sept. 27 1909.

To the Executive Committee of American Street & Interurban Railway Association:

Gentlemen.—I hereby certify that I have carefully audited the accounts of Bernard V. Swenson, treasurer of the Association, for the period Oct. 1, 1908, to Sept. 24, 1909, both inclusive, and I have found the same correct.

The statements showing receipts for admission fees and annual dues from member companies and from associate members check with the books of the Association, and proper vouchers have been audited covering all expenditures.

(Signed) M. R. BOYLAN,

General Auditor, Public Service Railway Co., Newark, N. J.

Respectfully submitted,

(Signed) B. V. SWENSON,

Secretary-Treasurer.

The next order of business was the annual address of the president, James F. Shaw. This address is published elsewhere in this issue. The address of President Shaw was received with applause and was accepted by the members of the association and a vote of thanks extended for the very able, interesting and practical report.

The report of the committee on subjects was presented by T. N. McCarter, Jersey City, chairman, and adopted.

**Report of the Committee on Subjects**

In presenting this report, your committee on subjects desires to express its appreciation of the large amount of work done by the affiliated association committees which have had immediate charge of the programs of their particular associations.

Considerable preliminary work was done previous to the first meeting of the committee which was held at the Association Headquarters in New York City on Jan. 28 last. At that time the programs of the American and each of its affiliated associations were discussed and outlined in detail, and a report embodying the results of the deliberations of the committee was presented to the executive committee of the American Association at its mid-winter meeting on the 29th of January.

While from time to time changes have become necessary as the work of the committee progressed during the intervening months, the original plan has been carried out in all important phases, and the results of the work of the committee during the past year are before you in the arrangement of the program for the Convention week; in the hours and places of meeting; in the addresses, papers and committee reports for the various meetings; and in the general disposition of the work of each session for the various associations, all of which is contained in the official program of the 1909 convention. As far as possible, the work has been so planned that the times of meetings of a similar nature do not conflict.

Respectfully submitted,

THOMAS N. McCARTER, Chairman; W. A. HOUSE, C. O. KRUGER, DANA STEVENS, R. N. WALLIS, PAUL WINSOR, C. B. HARDIN, C. LOOMIS ALLEN, Committee on Subjects.

The report of the committee on active membership, in the absence of C. S. Sergeant of Boston, the chairman, was presented by C. N. Black of San Francisco. The report was adopted.

**Report of the Committee on Active Membership**

To the end that a thorough and effective campaign for active membership in the association might be carried on during the year, your president, shortly after the close of the 1908 convention, appointed a large committee composed of gentlemen who are officials of member companies in the various parts of the United States, Canada and Mexico. This made it impracticable for the committee to hold any meetings and the report of its work for the year is, therefore, presented to you by the chairman.

The plan followed and the work done may be briefly outlined. The determining factors in the selection of the individuals composing the committee, were their prominence in the electric railway profession, their interest in the association and their geographical location. Each member was assigned a particular territory and was given the names of the member and non-member companies in that territory, together with a large fund of information relative to the association and its value to the electric railway companies, much of which was in printed form and supplied in quantities sufficient for distribution to these non-member companies. Each committeeman was given great latitude in the method of conducting his own campaign. One or more officials of every non-member company received not only communications from the committeeman in direct charge of the territory in which the company was located, but also from the chairman of the committee, from the president of the association and from the secretary's office. Some of these were in the form of letters, and some contained booklets, pamphlets or other printed matter descriptive of the purposes, plans and work of the association and its value to the member companies.

While you no doubt are somewhat interested in the manner in which the committee has operated, I feel that you must necessarily be more interested in the results obtained, and I take pleasure in reporting that 65 companies have become members of the association during the year, among which are such important companies as the United Railroads of San Francisco, the Los Angeles Railway Company, the Pittsburg Railways Company, the Brooklyn Heights Railroad Company, the Interborough Rapid Transit Company, the Old Colony Street Railway Company, the Winnipeg Electric Railway Company of Winnipeg, Manitoba, the Honolulu Rapid Transit Company of Honolulu, Hawaii, and the Sao Paulo Tramway, Light & Power Company of Sao Paulo, Brazil. A complete list of these new member companies is contained in the annual report of the secretary and treasurer. The annual dues to be received from them should increase our revenue not less than \$2,000.

Your chairman desires to take this opportunity to express his thanks to the members of this committee who have by their personal efforts and earnest exertions accomplished so good a work for the enlargement of the membership of the association.

Respectfully submitted,

C. S. SERGEANT,  
Chairman.

The president then called Vice President Arthur W. Brady to the chair, who presided during the remainder of the day's session.

The report of the committee on associate membership was presented by D. A. Hegarty of Little Rock, Ark. The report was approved and adopted.

**Report of the Committee on Associate Membership**

Because of the large number of members of the Committee on Associate Membership, and because of their widely different geographical location, no meeting of the committee has been held during the past year, and it becomes necessary for me, as chairman, to present the report of the work which has been done by its various members.

In the belief that a systematic and active campaign would result in a very largely increased associate membership, your president, early in the year, appointed a committee on associate membership.

In the choice of committeemen, it was the desire to bring the association into close touch with all phases of the electric railway business in the entire territory covered by the association. A great amount of individual work was done by the various members of the committee, some of whom were very active and most enthusiastic. Each committeeman was amply supplied with various pieces of print-

ed matter descriptive of the association, its associate membership and the value of such membership to those interested in the electric railway business. In addition to many letters written by the individual members of the committee, communications in the form of letters and printed matter from the chairman of the committee, from the president of the association and from the secretary's office, were sent from time to time throughout the year to thousands of individuals interested in electric railways in various parts of this country, Canada, Mexico and other foreign countries.

While the direct benefits of associate membership were at all times clearly and forcibly dwelt upon, an appeal was also made to the prospective associate member to take his stand with the many other individuals identified with the electric railway in general in an endeavor to create a better sentiment on the part of the public toward public service corporations, which is one of the primary objects of associate membership in the American Street & Interurban Railway Association.

While much effort has been made, not only by the committee, but also by many other individuals who co-operated with it and by the office of the association, the results obtained have more than justified the time, energy and expense devoted to this work. I am pleased to report that the associate membership on Sept. 30 at the end of the fiscal year has been increased during the past year from 249 to 817, a gain of 568 or 244 per cent.

In closing, your attention is called to the fact that this large increase in membership is due, in great measure, to the interest shown and hearty co-operation given by the Manufacturers' Association executive committee and by many individual members of that association. Another factor which played an important part in the large increase in the number of associate members was the official association pin, emblematic of associate membership, which was adopted at the 1908 convention.

Respectfully submitted,  
C. LOOMIS ALLEN,  
Chairman.

The report of the special committee appointed to consider the suggestions contained in the annual address of President Goodrich at the 1908 convention was read by Third Vice President George H. Harris, and was accepted and adopted.

#### Report of the Committee to Consider the Suggestions Contained in the Address of President Goodrich

In his address, presented at the 1908 convention, President Goodrich gave much consideration to the association work and made some very thoughtful suggestions concerning especially the method of conducting the annual conventions of the American Association and its affiliated organizations, which seemed to him would result in a stronger and better balanced organization doing more effective and valuable work for its member companies. These suggestions are fully set forth in the 1908 proceedings of the American Association; they are still fresh in your memories, and it hardly seems necessary to repeat them in this report. They were discussed at some considerable length in two of the sessions of the 1908 convention and as a result, the following resolution was adopted at that time:

"Resolved, that the recommendations of the president relating to a separation of the meetings of this association and its affiliated associations be referred to a committee to consist of the incoming president and seven other persons to be appointed by him, at least two of whom shall be past presidents, which committee shall report its conclusions, together with any other recommendations as to the organization and procedure of the association at the next annual meeting; and

"Resolved, further, that the report of the committee be printed and sent to the members of the association at the earliest possible date and not less than thirty days before the date of the next annual meeting."

In accordance with this resolution and soon after the close of the convention, your president appointed the following named gentlemen as members of this committee: J. F. Shaw, chairman; C. G. Goodrich, W. C. Ely, A. W. Brady, C. L. Allen, R. N. Wallis, A. E. Lang and G. T. Rogers.

At the time of his appointment, each member of the committee was requested to give the entire matter serious and careful consideration and to be prepared to discuss it in its various phases at a meeting to be held in conjunction with the annual midwinter meeting of the executive committee in January. Such a meeting was held at the association headquarters in New York City on Jan. 29 last, at which all members of the committee were present. As

a result of this meeting, the following resolution was duly adopted by the committee:

"Resolved, that it is the sense of the committee appointed to consider the recommendations of the president, made at the 1908 convention, that no change be made in reference to the holding at the same time and place of the annual meeting of the American Street & Interurban Railway Association and its affiliated and allied associations, but that such annual meeting be supplemented by a conference to be held in the City of New York, at the time of the winter session of the executive committee, which conference shall be open only to the president or other duly accredited representatives of the member companies, and which shall consider in executive session such matters as may be deemed of pressing interest and report to the executive committee its recommendations and instructions as the policy to be pursued in respect to such matters, and

"Resolved, further, that the chairman of this committee report to the annual 1909 convention of the American Street & Interurban Railway Association the conclusions and recommendations of the committee as contained in this resolution."

In accordance with the resolution passed at the 1908 convention, in which was embodied the request that the report of the committee be printed and sent to the members of the association at the earliest possible date and not less than thirty days before the date of the next annual meeting, such a printed report, containing the resolution adopted at the January meeting, was made to the member companies early in February.

This report is presented to you now in conformity with the resolution adopted by the committee at its January meeting that the chairman should report to the annual 1909 convention of the association the conclusions and recommendations of the committee.

Respectfully submitted,  
JAMES F. SHAW,  
Chairman.

A paper on "Organization, from the Standpoint of the Smaller Companies," was then read by Ernest Gonzenbach, president and general manager, Sheboygan Light, Power & Railway Company, of Sheboygan, Wis. This paper is published elsewhere in this issue. In presenting his paper Mr. Gonzenbach said that some of the things that he would say were as obvious as the sum of two and two, but there were a great many small companies that were not operating as well and did not handle the organization as efficiently as might be done, and the paper was written in the hope of benefiting those.

Mr. Hegarty thought Mr. Gonzenbach had covered the subject very thoroughly, especially in regard to the one-man power. That was a feature that ought to be taken into consideration, and there should always be an understudy for the other man, so that in case of illness or the necessity of change there would be a man to fill the place.

P. P. Crafts, Clinton, Iowa, said he was connected with a small company where it was necessary for one man to look after more than one department, and the method had always been carried out of having one man inferior to the heads of departments who was able at a moment's notice to step into his superior's place and carry on the work successfully, which had saved the day.

Mr. Foster of New Orleans stated that in the operation of small companies, it was necessary to depend very largely upon one man, who was usually the superintendent, because the president of the smaller companies was very seldom an operating man. The president provided for the financial interest of the corporation. The operation devolved upon the superintendent, and that man was generally a practical man, thoroughly familiar with the details of all departments, and he perfected his organization the best he could. If he could have an understudy or second man for every position, it was desirable that he should have it and as a rule he would have it. But there were small companies which could not afford to have men of very great ability. There were very small companies which had but one engineer and a fireman. It would be very expensive for such a company to have a second engineer. The best thing to do was to educate the fireman as rapidly as possible so that he might be able to fill



the position of the chief engineer in case anything should happen. The organization as outlined was without doubt a perfect organization, but the small companies could not all afford to organize in that way. Those that could afford to do so would come as near doing it as possible by having their second man or men in an inferior position educated to the highest degree possible consistent with that department. The larger organizations were operated in departments and the department heads were held responsible and each had an understudy, the department heads usually reporting to the chief operating official, chief executive officer. The idea he entertained about the smaller companies was that they would be very glad to have a perfect organization, but he thought that in practice it was not possible always to have as perfect an organization as could be desired.

H. W. Blake, *Electric Railway Journal*, said there was one statement which he particularly noticed in Mr. Gonzenbach's paper, and that was the reference to the demand for car maintenance employees and the impossibility of getting them. This paper might possibly be considered in connection with the reports of the committee on education, which last year had recommended a system of practice instruction for technical graduates and this year suggested a course of instruction for the non-technical men in the employ of the company. Possibly there might be a third kind of education or apprenticeship course under the auspices of the electric railway companies in order to train men in car maintenance work. At present no means existed by which a young man could learn that part of the business, and this work was constantly increasing in importance.

Gen. George H. Harries, Washington, D. C., stated that it was his fortune 15 years ago to move directly from an active military life into the presidency of a street railway; and, realizing his shortcomings, he proceeded to qualify himself. It was not a large company, as companies were regarded today. As the years moved along other companies were taken in one after another—mostly bankrupt, mostly the small, one-man company—until finally quite a system was made. There was no question but that there could be a very satisfactory organization in a small company today, a vastly better organization than was dreamed of at that time in that community. The company had not made any great stride. It had its corps of specialists, high grade men, the best that could be secured, he thought. But he looked back at that first company and was fairly well satisfied that it set a pace then which was a good, live gait today. It was possible to give much more of personal attention to the small company than to the larger one. The man who had the military organization to which Mr. Gonzenbach referred could see everything, and if he did not do everything he could supervise the doing of everything. He was thoroughly satisfied with the experience acquired in the one comparatively small company. Without that experience it would have been an extremely difficult thing to have succeeded. In the conduct of a public service corporation there was nothing better than a military system. He might seem to be prejudiced on that score, but it was as Mr. Gonzenbach had said, the oldest system. It had been brought down through the centuries and had survived. There was really nothing better, not merely in the operating, but in the other features of the business.

The report of the committee on education was presented by H. W. Blake in the absence of the chairman of the committee, Prof. H. H. Norris.

After this report had been read Vice-President Brady announced that as the hour had nearly arrived for the adjournment of the afternoon session, and there would not be time to give the report the thorough discussion its importance deserved, the discussion would be postponed until the meeting on Wednesday.

Secretary Swenson announced that President Shaw had appointed the following to serve on the committee to draw

up suitable resolutions on the death of Thomas Lowry of Minneapolis and of Howard F. Grant of Boston: A. W. Brady, chairman; Percy Warner and Anton H. Classen.

It was also announced that President Shaw had appointed a committee on resolutions relative to the convention, as follows: George H. Harries, chairman; P. P. Crafts and H. C. Page.

Secretary Swenson stated that A. L. Whipple, the chairman of the entertainment committee, wished to have an announcement made at this meeting in relation to the excursion over the Moffat road to Corona and return on Friday. Arrangements had been made with the Accountants' Association whereby the Friday sessions would be advanced to Thursday. The sessions of all the other associations would be completed by that time, so that there would be no session on Friday. Mr. Whipple desired especially that everybody procure tickets as early as possible from the entertainment committee at the entertainment bureau. The start would be made at 8:30 a. m. sharp and the return to the city about 5:30 o'clock. This was considered the finest trip out of Denver.

Mr. Swenson called attention to the necessity of validating all railroad tickets. Tickets to the Pacific Coast would be validated in advance of the departure of passengers, but not to exceed seven days in advance. Tickets which were for Colorado points, from the East especially, must be presented for validation on the date the return journey commenced. They could not be validated in advance. All tickets were validated at the ticket offices of the respective railroad companies over which the return would be made.

Invitations had been received, Mr. Swenson said, from the Business Men's Association of Saratoga Springs, New York, and from the Niagara Falls Bureau of Conventions, of Niagara Falls, N. Y., to hold the 1910 convention in those cities.

Adjournment was then taken until 2 o'clock on Wednesday afternoon.

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### CLAIM AGENTS' ASSOCIATION—TUESDAY MEETINGS

The Claim Agents' Association held its second and third meetings at the Metropole Hotel Tuesday morning and afternoon. The following program of topical discussions was completed at the morning session:

#### Morning Session

(3.) What is the best plan of having trainmen procure and report an increased number of witnesses to accidents?

(4.) Is it good practice, when statement of injured party is obtained of accident, to furnish him with copy of his statement?

(5.) Is a school of instruction for trainmen essential?

#### Afternoon Session

The afternoon program of topical discussions was completed. The questions raised were:

(6.) Should information be furnished newspapers regarding the work of the claim department?

(7.) What should be the relationship of the medical and claim departments? How can the medical best serve the claim department in the handling of accidents?

(8.) The claim department and its relation to the operating department.

In the evening a banquet was served to members of the association in the dining room of the Metropole Hotel.

The election of officers will take place at the closing session to be held at 9:30 this morning at the Metropole Hotel.

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### ASIRMA GOLF TOURNAMENT ABANDONED

Owing to the many unusual points of interest which delegates desire to see while in Denver, it has been decided by the entertainment committee of the Manufacturers' Association to abandon the Asirma golf tournament announced in the program of entertainment.

## PRESIDENT SHAW'S ADDRESS TO THE AMERICAN STREET & INTERURBAN RAILWAY ASSOCIATION

The State of Colorado is famed for its natural resources, climate and scenery, and the center of its industries, its politics and its social life is its capital, the city of Denver named for Gen. James W. Denver, first governor of the territory of Kansas, of which Colorado was a part when the city was founded. Denver, in half a century, has grown from a frontier settlement to a beautiful and prosperous city of 225,000 inhabitants, with an area of 60 sq. miles and with 1,200 miles of streets, many of which are magnificent boulevards interconnecting its 14 beautiful parks. The city has nearly 2,500 factories with annual payrolls of over 12 millions of dollars and 18 banks with resources of 75 millions of dollars. Seventeen great railroad systems enter the city and 126 passenger trains arrive and depart every 24 hours. Much of the development of Denver may be ascribed to the fact that many of those who amass their fortunes in Colorado remain at home and spend their money there. This accounts, in a considerable degree, for the city's modern business district and beautiful residences, and its well-paved, clean and brilliantly illuminated streets.

On account of the great distance to Boston, no representative of the Denver City Railway Company, as it was then called, was present at the organization meeting of this association in 1882, but the following abstract from a letter by L. C. Ellsworth, president of the company, was read at the organization meeting:

If it were practicable, I should be glad to be present, but I hardly feel that I can see my way clear to meet with you. If I understand aright the objects of the association, it has my hearty approval, and I shall be glad to do what little may lie in my power to advance its interests. I shall be glad to become a member of the association, and trust that I may hear from you the result of the meeting.

The first annual report of the association, however, shows that the Denver City Railway Company paid its initiation fee and dues, and by this act became a member of the association on March 6, 1883, less than three months after the association was formed, and it was represented at the first annual convention after the organization meeting, which convention was held in Chicago in October, 1883, by D. H. Longstreet, who was then a director of the company, and who, later, in 1892, when he was vice president and general manager of the West End Street Railroad Company of Denver, was honored with the presidency of this association. No better illustration of how faithfully the Denver street railway people have stood by the association during this long period could be had than by the record of its representation at the annual conventions. Including the organization meeting and the present convention, there has been a total of twenty-eight such meetings at which the Denver properties have been represented at all but seven. I doubt very much indeed if any other street railway property can show a better record. Another fact which makes this record even more impressive, is that it has been necessary for the delegates of this company, in attendance at previous conventions, to travel an average round trip distance of nearly 3,000 miles, and to several of the conventions the company has sent three and even four delegates. Surely the Denver City Tramway Company officials have earned the right to have a convention held in their own city. While Denver's record is undoubtedly unique, many of our other Western companies have constantly sent delegates to the convention from very much greater distances, especially those companies located in Texas, California and the Pacific Northwest.

The center of gravity of the twenty-seventh annual meetings of this association which have preceded the Denver convention, lies about midway between the cities of Akron and Youngstown, Ohio, which is a distance of approximately 500 miles east of the Mississippi River. This is very close to the actual center, from a mileage standpoint,

of that portion of the United States and Canada which lies east of the Mississippi River. Therefore we may say that, on the whole, the territory west of the Mississippi River has not been considered in the location of convention cities in the past. Those member companies located west of the Mississippi River have, for the past few years at least, constituted over 20 per cent of our total membership and have contributed over 20 per cent of its annual revenue. Is it any wonder our Western member companies have had the feeling for several years past that we should hold a convention in the territory in which they are located, and is it any wonder that many Western companies have felt that the association was not national in its character, but was dominated by the wishes of the companies lying far east of the Mississippi River? It was a careful consideration of such facts as the foregoing which led the executive committee, through its convention location committee, to decide upon Denver as the 1909 convention city. One of the determining factors was the opportunity that this would afford to the representatives of member companies to become familiar with the most excellent system of the Denver City Tramway Company, which is recognized as being one of the very best in the country and which has many features of interest to the street railway fraternity at large, among which may be especially noted its very light weight cars of distinctive design, all of which are built in Denver; its shops and yards in which all special work for tracks is constructed, and its large and very complete storerooms for supplies.

### Magnitude of the Electric Railway Business

The majority of those who are engaged in the electric railway business are so much occupied with their various duties that they seldom, if ever, stop to consider its magnitude. In round numbers, there are 1250 operating street and interurban railway companies in this country, with a total of 35,000 miles of single track and 75,000 passenger cars. The total number of passengers carried annually is 10,000,000,000 and the gross annual income is \$440,000,000. The total outstanding par value of stock and bonds is nearly \$4,000,000,000, and there are 225,000 salaried employees and wage earners engaged in the operation of these properties who receive, annually, more than \$150,000,000 in compensation for their services. In considering the magnitude of the street railway business, there should also be taken into account the many millions of dollars invested in large and small manufacturing enterprises which supply the electric railways with their materials, and the many thousands of men who are directly and indirectly employed by these industrial concerns.

### Important Events of the Past Year

Financial and general business conditions have so important an influence on the traffic and earnings of electric railways that it is possible to emphasize with great satisfaction the improvement which has taken place in the last 12 months. Ordinarily, the business of street railways is stable and is not affected in the same degree as are industrial properties, by fluctuations in general conditions. Gross revenues, under circumstances which usually prevail, should show a fairly uniform rate of increase year after year. With a street railway that is fairly well established in a district where there is good diversity of business and a reasonable amount of pleasure traffic, a diminished rate of increase or the failure of the gross revenue to show any enhancement over the previous 12 months, represents all that would take place under panic conditions of the character through which this country has recently passed. In certain districts, however, where the traffic is dependent almost entirely upon the operation of large industrial plants, serious curtailment of revenues follows decreased industrial activity.

During the association year which has just ended, sub-

stantial recovery from the effects of the panic of 1907 has been manifest in the earnings of many of the companies. The recuperative powers of the industries throughout all parts of the United States are so great that slight improvement grows quickly into substantial gains and the traffic of street and interurban railways resumed rapidly the position which it should hold in a country that has greater business vigor and more promising prospects for development than any other known in the history of the world. The effect of reduced traffic was apparent not only in the revenues of the company but also in the enforced suspension of improvements resulting from decreased earnings and the inhospitable attitude of the money market. The difficulties of borrowing funds at reasonable rates which were experienced in the year preceding that which has just closed were followed by accumulation of funds in banking centers, easy rates and an improving and eventually excellent market for bonds. This situation has permitted many companies to fund floating debts and has enabled resumption of improvements and extensions. The next logical step resulting from the present aspect of the business situation will be the creation and development on an extensive scale of plans for electric railway construction in all parts of the country where there are fair traffic prospects that it will be possible to establish such lines on a permanently successful basis.

A movement which will have profound effect upon the future of street and interurban railways is that which originated in Massachusetts for the adoption of needed increases in rates of fare. While the fixed rate of 5 cents which was adopted as standard for urban street railways in the early history of the industry was believed to be adequate compensation for the risks involved in the enterprise, it was found in later years that the public demand and progress of the art required improvements which added greatly to the capital cost of properties of this nature. With the substitution in some cases of cable railways for horse car lines, followed by another change when the desirability of electricity as a motive power was made plain, the original investment was increased several fold. The effect of these changes, so far as the public was concerned, may be realized by comparison of the old types of cars and equipment with those which modern practice prescribes and recollection of the character of service formerly rendered. From a few main lines serving only the districts where the most inviting density of traffic prevailed, the companies have increased their investments until, in all large cities today, they reach into the outlying suburban districts where the population and resultant traffic are small. In recognition of public demand, the railways have extended their lines, permitting settlement of outlying territory and decentralization of the population. Arising in part from the necessity of these changes and in part from recognition of the public convenience afforded, the transfer system has come. With the establishment of the transfers, there has been a steady dilution of the average rate of fare per passenger carried, resulting not only from the legitimate tender of transfers but also from the illegal use and unjustified barter of this privilege which has been granted by the railway companies in many instances where they were not required by franchise conditions. High speed interurban lines have also found increases in fares necessary to meet the larger expenses arising from greater costs of labor and material, and, in some instances, the failure of expected traffic to materialize. A general movement toward a rate of fare which shall be based more scientifically than has been the case in the past upon the cost of operation with allowances for unforeseen expenditures is a just course for events to take.

Present railway conditions may be improved in either one of three ways: (1) By increasing the present rates of fares. (2) By reducing the distances the passengers are carried under the present rates of fares. (3) By relieving the companies from certain forms of taxation, State or municipal requirements.

Recently, instead of being relieved, the corporation tax under the Payne tariff law of 1909 put an additional tax on our business. The constitutionality of this tax will be passed upon by the courts. Personally, I am opposed to such a tax as it not only seems unjust to the corporations, but also to the owners of the capital stock who are to suffer loss from their incomes while the owners of bonds are relieved from any additional burden. While undoubtedly many will disagree with me, I believe the proposition to amend the Constitution by giving Congress power to levy a tax on incomes (at least in cases of emergency) is much more just, as it will reach those who are possessors of large incomes and will not materially affect others.

The point I wish to particularly emphasize is, that the corporation tax penalizes the pioneer or developer of enterprises whose holdings are represented by capital stock and that it relieves from taxation the owner of the underlying securities upon which there is a minimum of risk.

The Cleveland situation is still somewhat chaotic but continued injustice has been done during the year to the company which owns the street railway system in that city. The people of Cleveland have now rejected twice at referendum elections projects fathered by Mayor Johnson. The number of years spent in fruitless negotiations have been prolific of benefit to the political agitators concerned but equally prolific of injustice to the owners of the property affected.

Public service commissions are now practically active forces in the management and operation of street and interurban railways in the States of New York and Wisconsin. Whether or not these commissions will follow the conservative course which has characterized the attitude of the Board of Railroad Commissioners in Massachusetts is a question which can be determined only in the future. Reasonable public regulation on the part of the State may produce conditions which will prevent repetition of the disgraceful contests which political agitators have been able to wage in some of the large cities in the country during the last few years, notably in Chicago and Cleveland. To be effective, permanently, regulation of this character must safeguard the interests of the corporation and its employees just as effectively as it protects those of the traveling public.

The important influence of rapid transit systems on city development is being realized in New York as never before. Hardly had the present subway been completed than its traffic capacity was taxed to its uttermost. Since the initial trip, various improvements have been adopted by which the length of station stops has been reduced. This has proportionately increased the carrying capacity of the subway, but there has been no cessation of the demand for the development of further rapid transit routes which seems as imperative as ever before. During the past year, the Hudson & Manhattan Railroad, the most important as well as the longest subfluvial railway in the world, has been in operation connecting the States of New York and New Jersey by four tunnels and is the precursor of many other similar lines which will undoubtedly be laid under the Hudson River and other wide stretches of navigable waters.

No important trunk line railways have changed to electricity this year any portion of their suburban systems for which plans had not previously been made, but the officers of those companies which are now using electric power have expressed themselves as well satisfied with the service rendered. A new type of locomotive, differing from any used on the other trunk lines of this country, has been developed for the Pennsylvania Railroad tunnel, and several of the railroad companies in the Central and far Western States are carefully considering the adoption of electric power for certain sections of their lines.

Each of the sectional and street railway associations has shown activity and growth and several new associations, designed in some cases to foster the interests of all public utilities, have been organized in various parts of this coun-

try. This willingness to co-operate in the advancement of mutual interests is a healthy sign and one that should be encouraged. Our own organization and its affiliated and allied bodies have never before been in so good a condition and at no previous convention has there been such a volume of valuable reports and papers.

#### The Association in the Past

As many of you know, the American Street Railway Association was organized in Boston on Dec. 13, 1882, by the representatives of 56 railway companies. This was in the old horse car days, before the advent of cable traction, when all of the companies were small and located in the more important cities, there being no interurban railways of any kind. The association continued to exist through a period of nearly 23 years with a somewhat fluctuating membership and value to its member companies, although on the whole greatly increasing in its membership and its effectiveness over this portion of its life. At the 1905 convention its membership was composed of 183 companies in good standing, and it was recognized as an association of great importance to the electric railway interests of the country. For two or three years previous to the 1905 convention much consideration was given to plans for reorganizing the association and combining with it the accounting, engineering and claim departmental associations which had been organized quite independently to carry on work in their respective branches.

During the three years after the reorganization in 1905 and immediately preceding the year just closed, the work done by the American Association and its various affiliated bodies fully demonstrated the wisdom of the reorganization. The bound volumes containing the reports of the various associations show the immense amount of work done during this time.

At the end of the first year the membership had increased to 200 companies and 113 associate members had been added. At the end of the next year the company membership had increased to 227 and the associate membership to 148. At the close of last year the company membership was 262 and the associate membership 249. The revenue the first year was \$22,800; second year, \$24,700; and the revenue last year was \$26,800.

#### The Work of the Year

The association work of the past year, like that of the three years immediately preceding, may be divided primarily into three parts: 1. That done by the committees of the American Association. 2. That done in the general office of the association. 3. That done by the affiliated associations.

In addition to several special committees, the American Association has committees on subjects, membership, insurance, education, welfare of employees, compensation for carrying United States mail, public relations and Interstate Commerce Commission affairs, all of which will present reports at the sessions of this convention. The members of these committees are all prominent in the electric railway business and they have been selected for their peculiar fitness to serve on particular committees. They have devoted much time and thought to the work before them, and the reports which they will present should be fully discussed and given careful consideration.

Four years ago, when the New York office was first established, the office force consisted of the secretary, an assistant and a stenographer. Since then the work has increased so rapidly that at present there are eight people employed in the association office, and even that number is not sufficient to accomplish the work which must be done without the necessity of some or all of the office force working several hours overtime a large portion of the year. Some of the many duties which have devolved upon the New York office during the past year are the following: Between 15,000 and 20,-

000 first-class letters written, signed and mailed; distribution of 23,000 data sheets, 15,000 bulletins, 16,000 pamphlets, 6,000 folders, 1,000 classifications of accounts, 2,500 city and interurban rule books, 900 copies of the engineering standards, 5,700 volumes of annual proceedings of the various associations, 5,000 copies of the convention advance papers, all of which were required to be prepared for printing and proof-read; 12,500 convention bulletins, the sending out of blanks and forms to various member companies, nearly 1,000 replies to requests for information from member companies, many of which required the preparation of special compilations, besides the routine work heretofore required of secretaries of the affiliated associations, all of which has been turned into the main office. In addition, the vigorous campaign for membership this year has naturally largely increased the work of the main office in the sending out of written communications and the working up and distribution of printed matter; and the resultant effects of this campaign, as shown in the large increases in both classes of membership, has also entailed a large amount of additional labor in the matter of written communications, distribution of literature, proceedings, etc.

I wish also to call attention to the very satisfactory increase in our active and associate membership during the past year. The active membership has been increased by 65 companies, and among these you will find some of the most prominent electric railways of the country. The enrollment of associates has during the present year been increased from 249 members to 817. This result has been brought about by various means, as, in addition to the work of the membership committee, thousands of written and printed communications, folders, etc., have been distributed in an endeavor to awaken interest among individuals which is so necessary if our association is to do the full good of which it is capable. You will recall that at the 1908 convention there was adopted an official badge or pin emblematic of our associate membership. The first lot of these pins was distributed toward the latter part of January last. The success of the pin was immediate, and today nearly 500 of our associate members are wearing it. As a means toward that publicity which is so essential to our work, I believe the adoption of this pin has been one of the best minor moves the association has ever made, and unquestionably great good can be brought about through the open display of this emblem by each and every one of our associate members. All this has not been done without a great effort, however, and, necessarily, a considerable expenditure of money. Much praise is due to the members of the active and the associate membership committees, and I wish to take this opportunity of thanking them, not only on behalf of myself but of the association and its executive committee as well. They have done excellent work, have spared no pains to accomplish the end desired, and the results speak for themselves.

I feel that I cannot let this opportunity pass without calling attention to the assistance given this year by the members of the Manufacturers' Association, not alone in the presentation of 1000 associate membership badges and the badges for the past presidents, but particularly with regard to associate membership itself. Three hundred and eight individuals, representing the members of our Manufacturers' Association, are enrolled as associate members with us. These represent 121 companies out of a total membership of 287 companies in the Manufacturers' Association, and 164 of these members are wearing the associate membership pin. It is needless for me to call attention to the great good these associate members can do us in effecting a better understanding between the public service corporation and its patrons. They travel from place to place and are thrown in close touch with those who take advantage of the facilities which our transportation companies offer. They come to know them well and intimately, and their words can do much good for our business if raised in support of

the work which we are doing, the service we render, and the small amount of return we receive.

The attendance at this convention, located so far away from a large majority of our member companies, is in no small part due to the magnificent work of the members of the various transportation committees which have the sincere appreciation of every member of our association.

This year has also brought about a closer relation between our association and the State and sectional organizations. It has been our endeavor to be represented at each of the meetings of these various associations, with the result that there is a strong tie existing between our association, which is national in character, and these other bodies which are more or less local in their field of action. This is as it should be, as our association obviously cannot take up those questions of detail such as the local organizations discuss, but must necessarily work along lines which are more general in character. Our vice presidents and others who have officially represented the association at many of the meetings of these organizations during the year just closed, have done splendid work and much credit is due them for the time and energy expended in our behalf.

#### Member Companies Must Co-operate in the Association Work

Former presidents have touched upon the necessity for co-operation among our member companies in the furnishing of information to the association. Having been in close touch with the work during the past year, I have come to realize more clearly the need of this co-operation. Our member companies require at times certain statistical information to combat restrictive legislation, public ill-feeling and other adverse sentiments or conditions. The first thought should be, and in many cases is, the files of the association's headquarters. The association may or may not have investigated the particular subject in which the member company may be interested. If the subject has been investigated, certain data are, of course, on file, and if the subject has not been investigated, recourse is had to other member companies for such information as they may be able to furnish. These other member companies, however, may not have found the necessity for having the information asked for, either as applied to their own work or that of other companies, and oftentimes pay little heed to the requests from the main office. The consequence is, that though there is on file a great deal of information, it is neither in quantity nor quality such as an association of the scope of our own should have. A committee has been appointed to suggest certain subjects of investigation for the ensuing year, and I ask you to assist in the upbuilding of the association and the increasing of its value to the member companies in times of need by full co-operation in the furnishing of information when requested by the association itself or by any of its committees. We cannot hope to reach the point of maximum value to our members without your aid, and I might also say that the information furnished by non-member companies (and for which they received comparatively little in return) in comparison with that furnished by the member companies is far in excess of what would naturally be expected.

Criticism may be made that much of the information has been asked for at one time, more particularly this year, and that this fact precluded some of the smaller companies and, indeed, many of the larger ones, from giving the time necessary to properly provide the data called for. It is hoped that the coming year will see this remedied, and that the information will be gleaned at different times throughout the whole year. Doubtless, this will result in more generous responses, and I hope that you will each do your share toward giving as much of that which is asked for as you can consistently.

No doubt, there are many of us who fail to realize the

great extent of the committee work of the various affiliated associations. For your information, I would state that last year 132 individuals were engaged in this work. The work of these specialists is fully set forth in the valuable reports which are being presented at this convention. In a way, every one of these committeemen has been added to the working force of your company. Surely, the careful thought of 132 master minds upon important subjects in the various phases of the electric railway profession cannot be other than of very great value to every member company. Many railway officials fail to realize the handicap under which these committeemen work in not receiving full returns from the various companies covering the questions asked by the committee bearing on the subjects under consideration. Surely, when so many busy men, having important personal duties to perform, are willing to devote their time and energy to the welfare of the companies in general, these companies in their turn should be more than glad to devote such time as may be necessary to supply the required information.

As indicative of the growing appreciation of the work of the headquarters of the association, it may be stated that during the year just closed nearly 1000 requests for information have been received, among which I would call particular attention to the following: inquiry relative to the practice of electric railways in connection with the use of air brakes on single truck cars; request for wages paid by the different companies in connection with arbitration proceedings; request for information relative to taxation; request for information regarding the minimum headway of cars and passengers per car mile for use in municipal investigation; requests for information regarding miles of track per population; information relative to the practice of different electric railway companies in connection with the handling of overages and shortages; information relative to compensation received by electric railways for carrying United States mail; information regarding the practice of different companies in connection with funeral car service; information regarding the operation of mail boxes on street cars; information regarding agreements with city and interurban lines relative to the use of tracks; information regarding the practice of different companies in connection with the handling of coal shortages, in addition to which have been many requests for information regarding transfers.

#### Financial Status of the Association

While great care was exercised by the officers of the association in the matter of expenditures during the year preceding the one just closed, the report of the treasurer on Sept. 30, 1908, showed a balance of but \$3,365, which was a decrease of \$2,772 in comparison with the balance at the close of the preceding year. This resulted from the fact that the work of the association was steadily increasing, while the receipts did not increase in like proportion, due to the financial conditions prevailing throughout the country at that time. The balance on hand for the year ended Sept. 30, 1909, was \$10,564.79, an increase of \$7,199.55 over last year, and a difference for the year of receipts over expenditures of \$6,828.70. To make the figures for the two years comparable, however, we should deduct the amount gained by the association on account of better terms and arrangements for locating the 1909 convention in Denver, over those secured for the 1908 convention. With this deduction made, the balance would appear as \$5,564.79, or an increase of \$2,199.55 over the balance shown on Sept. 30, 1908, which, considering the deficit of 1908, means an actual gain of \$4,972.26. The expenses for 1909, as you will see, show a slight increase, but this is due almost entirely to the increased committee work and the necessary expenses of the newly formed Transportation & Traffic Association, which in 1908 was charged with expenses of but slightly over \$100, while in 1909 this association has been charged

with \$1,668, some of which expenditure, however, was incurred in 1908.

#### The Work of Our Affiliated Associations

I wish to dwell briefly upon the work of each of the four affiliated associations during this year.

The most important features of the work of the Accountants' Association has been the establishment, in connection with the division of statistics and accounts of the Interstate Commerce Commission, of a working basis for the consideration and determination of questions arising under the classification of the commission, which, as you know, is similar to that of our own. The result of this arrangement is, that any questions coming before either the commission or the Accountants' Association are passed upon by the classification committee of the Accountants' Association. The second matter which I believe to be of importance, is the consideration of the uniformity of interline accounts and settlements which has had careful consideration by the special committee and which will report to the convention of the Accountants' Association this year. Another matter is the taking up again of the work begun at the 1904 convention of the joint committee of the Accountants' and Engineering associations looking to a clear understanding of the accounting requirements of the engineering officials. I feel this is a gratifying manifestation of the good the affiliated associations can do by joint action in establishing better relations and understanding between the representatives of the different associations in the same and different companies.

The work of the Engineering Association is done entirely by five committees which pay particular attention to equipment, power distribution, power generation, way matters and standards. The value of this method of conducting the work of the association is clearly shown by the admirable reports which are being presented by these various committees. I wish to call attention, also, to the value resulting directly to the company in permitting its men to serve on these committees. While a large amount of time is necessary, they are brought in touch with other men in their particular field of activity and in so doing obtain a great deal of information, only a small portion of which, perhaps, bears on the subject in hand. The filling out of data sheets is also, in my opinion, of great value to the company, as it calls the attention of the engineers, as well as the higher officials, to the actual facts and conditions so far as their own property is concerned.

While the Claim Agents' Association has been active throughout the year in its particular line of work, I wish to call to your attention, especially, the interesting program which will be given consideration by that organization. In the past some managers have not given sufficient consideration to the claim department, but have looked upon it as an avenue through which possible dividends disappear, whereas there is no question but that, in many cases, a well-supported and well-conducted claim department will make it possible to pay these dividends.

The first convention of the Transportation & Traffic Association was held last year and the value of the work has done more than justice to this organization. During the past year its work, like that of the Engineering Association, has been done entirely through committees. The reports of these committees will cover the training of transportation employees, passenger traffic, transfers and transfer information, freight and express traffic, city rules and interurban rules. These committees have been very painstaking in their work and our association should take action in approving and recommending for adoption the reports of the committees on city rules and interurban rules.

I have already given consideration to the work of the different associations, the results of which are for the most part contained in the various papers and committee reports to be presented at this convention. Every railway man here

should attend as many of these meetings as possible and should participate in the discussions. It is only in this way that the greatest value may be obtained from these convention meetings.

In closing this review of the association work of the past year it is not only my duty but my pleasure to call to your attention particularly the great assistance we have received at all times and upon all occasions from the technical press. This has come not only in the wide dissemination of our notices, committee reports, papers, etc., through the columns of the weekly publications, but also in the loyal support given to us in editorials and in valuable suggestions and information bearing on various lines of the association work.

#### The Exhibit of the Manufacturers

It is with great pleasure that I call your attention particularly to the magnificent, comprehensive and valuable exhibit which our good friends, the manufacturers, have brought together for your benefit. I wish to forcibly impress upon you the desirability of devoting as much time as possible outside of the hours of the convention sessions in which you are particularly interested, to the inspection of exhibits. By so doing you will not only find yourselves fully repaid, but you will also show to the manufacturers your appreciation of the time, effort and money which they have expended in this connection.

#### Committee on General Policy

While I feel that much of value has been accomplished by our own association this year in the gathering and disseminating of data required by member companies in specific cases, in the distribution of information covering the field in general, in the advertisement of the work of the association through correspondence, the distribution of literature, representation at various meetings held throughout the country and the publication of notices of the many committee meetings, all of which were fully described in the columns of the technical press, in the adjustment of this committee work along certain well defined lines which the experience of the past four years has seemed to determine and in the added strength which our increases in membership have given us, personally, I feel that much has been left undone. The great difference of opinion which has always existed concerning the nature of the work the American association should do makes it difficult for the presiding officer to settle upon any hard and fast policy for the prosecution of the work, and the realization that this condition should be immediately remedied has suggested to my mind the formation of a committee to consider and outline certain specific lines along which the American Association should work during the coming year. Your executive committee has appointed such a committee, and it is my hope that it will submit to the executive committee a detailed program of just what work the association headquarters should engage upon during the year 1910.

#### Closing Remarks

In closing, I wish to briefly dwell upon the future of the association. The affiliated associations have done much valuable work during the past four years and if they continue to advance in the future as they have in the past, we need have no fear but that they will take care of their share of the work in the best and most efficient manner. The American Association should at all times assist its affiliated bodies and give them every possible encouragement. This may be done by officially approving the standards created by the Engineering Association, the classification of accounts of the Accountants' Association, and the books of rules of the Transportation & Traffic Association; and giving official sanction to other important matters which are taken up and acted upon by these various bodies.

I wish to impress upon you not only the desirability but

the necessity of increasing the membership in the association, and thereby increasing the revenue with which to carry on this great work. There have been many things left undone in the past simply because the association did not have the necessary funds. Instead of a membership of 325 companies and 825 associate members, we should have a membership of at least 750 companies and 5000 associate members. Instead of an annual revenue of \$38,774.20, we should have an annual revenue of from \$60,000 to \$75,000. These figures may seem somewhat startling to those who have not given the matter careful consideration, but they are no larger in proportion than what have been secured and are being obtained in other great national organizations of this general character.

Electric railways are now generally recognized as the most important agents in existence in reducing the congestion of the tenement districts and in permitting the city worker to bring up his family in the country where his wife and children can enjoy plenty of light and air and a freedom not possible in city life. At no previous period in the history of the country have the interests and welfare of our fellow citizens been so dependent as now upon the roads which we operate. A very large part of the credit for these results is due to the activities of this association and we may well be proud of what it has accomplished. Some claim that sentiment has no part in business. But it seems to me that every member of this association can properly be considered as having assisted in the development and extension of our industry and has, by just so much, helped to make the world better and has thus improved the physical, moral and intellectual condition of his fellow men.

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### THE HOSPITALITY OF DENVER

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No higher compliment could have been paid to the local convention committee of Denver than the unanimous and sincere expression of approval heard yesterday and on Monday of the exhibit arrangements, the courtesies extended by the railway companies and many social and civic bodies in the city, the program of entertainment provided and the spirit of whole-hearted hospitality and good-fellowship which pervades all Denver. There has been nothing perfunctory in the efforts of the Denver City Tramway Company and the distinguished citizens of Denver who comprise the local committee to make the convention a success. They were on hand when the special trains began to arrive to extend a welcome such as is the privilege of few associations to receive in any city. They called on the delegates in their hotels to assure themselves that everyone was comfortable and satisfied. At the first social function of the convention, the reception at the Brown Palace Hotel on Monday night, the committee was present in a body to greet the officers of the associations and all of those whom they had not before had an opportunity of meeting. The reception accorded to the delegates at the associations by the citizens of Denver will long remain the most pleasant recollection of the first visit to the far West.

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### HEAVY FIRST-DAY REGISTRATION

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The useful official list of members and guests of the various associations reveals the gratifying fact that the first day's registration was heavier than at Atlantic City. The first list at this convention contains 105 printed pages of names, compared with 84 in the corresponding list of last year. The list shows a total registered attendance for Monday of about 2150, of whom about 735 are ladies. Several hundred names were added yesterday, so that at the present time the total attendance is probably over 2500.

### MEETING OF THE ENGINEERING ASSOCIATION

The first meeting of the Engineering Association was called to order by President Winsor at 2:15 o'clock in the Rose Parlor. Mr. Winsor then read his annual address. This appears elsewhere in this issue. The president announced that he would be obliged to attend the meeting of the American Association and the vice-president, F. H. Lincoln, took the chair.

The secretary then read the annual report of the executive committee, consisting of the minutes of the meetings held by the committee Nov. 16, 1908, at New York, and Oct. 4, 1909, at Denver. Upon motion it was accepted.

The vice-president then called for the report of the secretary and treasurer. The secretary presented his report, showing the expenses of the year to have been \$3,197.61. Upon motion the report was accepted.

The vice-president then called for the report of the committee on way matters. As it had been in the possession of members for thirty days it was not read. E. O. Ackerman of the committee presented certain minor amendments to the printed report. They are in the report as printed in abstract elsewhere in this issue.

#### Discussion on Way Report

Charles H. Clark of Cleveland said that he thought the 17/32 in. web of the 7-in. T-rail of Section A was none too strong. He believed that corrugation was caused to a large extent by the lightness of the web of the rail. In most cases, the web is about 7/16 in. thick, or less than 1/2 in. As the web in the rail of Section A was more than 1/2 in. it should be approved. The rail of Section B has a web only 7-16 in. thick. This is too light. The rail shown in Fig. 3 is the standard used in Minneapolis. The flange way blocks shown were cut and he thought that it cost about 6 cents each for cutting the blocks which averaged 4 in. to 5 in. in width. That is, it cost about 36 cents a foot for cutting these blocks on both sides of the track to go under the T-rail. The blocks are of granite, and the rails are cast welded, a process of which he did not approve. In Cleveland, all new track construction is standardized for steel ties and this construction was required by city ordinance. The construction differed somewhat from that on page 399 and used in Utica, which was also with steel ties. In Cleveland 10 in. of concrete is laid longitudinally under the rail. This, with a 5 in. tie, gives 5 in. of concrete under the ties and 10 in. under the rail between the ties. The concrete is installed first between the ties and under the rail and then the space between is filled with dirt so as not to have over about 5 in. of concrete under the pavement. Mr. Clark approved of the recommendations of the committee in regard to T-rails, except that in large cities like Jersey City, Newark and Boston, where the teams follow the track, it might be necessary to use granite paving. In Cleveland, Rochester, Syracuse, Utica and Toledo, and other cities in the Medina stone country, that stone is used and makes a very fine pavement except where the teams are confined strictly to one place. Under such circumstances it will rut out. With asphalt paving, where the teams follow the tracks as in Buffalo and a half grooved rail is used, a groove is worn in the pavement about one half inch below the head of the rail. For such streets, the committee recommends a girder rail, adopting the recommendation of the 1907 committee on way matters, of which Mr. Clark was a member.

This section is called the Cleveland section. It is a 7 in. rail with a 3 in. head, about a 3/4 in. slope back and a 3/4 in. groove. The top of the groove is 1/2 in. under the head of the rail and the side of the groove projects out about 3/4 in. toward the pavement. That was on account of automobile tires. When wagons drive in the tracks, they sharpen the rail. On other sections such as the No. 95-319 and the 94-

313, this injures automobile tires. Where this is apt to occur, Mr. Clark believed it desirable to use a rail with a groove sloping out like a trilby section although not so wide as the true trilby. The 7 in. rail has been adopted in Cleveland because it gives a low weight with a strong rail. On Prospect Street in Cleveland, the company is using this rail with a 5 in. paving stone. The cost of the paving stone at Medina is about \$1.45 and the freight from Medina to Cleveland is \$1.45 a ton and there are about 3½ yards to a ton. This 5 in. block gives just as good a paving as a 7 in. block. The 7 in. rail is also well adapted for brick paving, with a 5 in. or 4 in. brick. Mr. Clark built a line on Long Island with 80 lb. A. S. C. E. rail with a brick paving and it is giving satisfaction.

As regards specifications for open-hearth steel rails and rolling, he did not believe enough was known to justify the association in saying very much about the subject. He was using open-hearth rails at present and could not get anything else now, but the companies perhaps will go back to Bessemer. A prominent steel man had told him that Bessemer was as good as open-hearth rails. Mr. Clark thought that engineers should advocate wider treads for the wheels. This would require a wide headed rail and for that reason a 3 in. head was adopted in Cleveland. As regards special work, he thought most manufacturers were doing all they could for the companies but believed it would be a good idea, in placing orders for special work, to specify that the heads of the rails should be planed back 4 in. because he believed that the companies before long would adopt wheels with a wider tread.

George Weston, Board of Supervising Engineers of Chicago, said that the Chicago City Railway Company and the Chicago Railways Company were confined to a type of grooved rail by ordinance, although he believed that every engineer who had studied track construction and had had anything to do with its maintenance and care would prefer a T-rail track, provided the pavement could be laid in a permanent manner to withstand wagon traffic, abrasion, etc. The Calumet & South Chicago Railway Company had recently been granted the right to use Shanghai T-rail construction on certain streets in the outlying districts, subject, however, to the approval of the Board of Supervising Engineers. He hoped to be able from this installation to obtain some information regarding the Shanghai rail track construction. He said that in Chicago very little T-rail track construction had been laid up to the present and where the companies had installed it they had met with serious objections from the aldermen, teamsters and citizens generally, who seemed to object to its use. Up until about two months ago the paving done in the T-rail track construction was brick, with a groove in the brick that fitted up against the rail and the flangeway ran in a groove formed by the track. It developed that a great deal of heavy teaming on some portions of the streets on which this track was laid resulted in the abrasion or breaking down of this groove or nose on the side of the track and a method had recently been adopted in Chicago of laying the track, which is shown on page 700. The ordinary paving brick is laid flat on the end and crowned in the center. Mr. Weston thought, from the experience he had had with the nose brick, that this plan will be more satisfactory. They had not tried as yet the use of granite block, along the side of the rail, but he was greatly impressed with the advantage it would have in keeping the pavement in contact and preventing the wear.

He said he wished to make the same criticism as Mr. Clark about the digging of tie holes for the steel ties. In Chicago they first adopted something along that line—namely, they had a heavier section of concrete where the concrete was laid under the ties, but excavated to a less depth in between the ties, leaving a little truncated formation of earth. It was found, during the construction, however, that the men tramping over the concrete in the work of laying

the track, tramped this earth down and it was necessary to clean it out, if they wanted to maintain the exact section of the grade, and then put loose dirt back in the track. After considerable study and observation they had concluded it would be better construction to excavate the track to one level throughout and have the concrete all of the same level and roll the foundation. With the digging of tie holes it was impossible to roll the foundation, and he believed that that was a very serious objection. Their type 3 track has a rolled stone foundation with ties on 2-ft. centers and the concrete in between the ties. With this type of track they had observed in many cases that when they rolled this foundation they would find a great many soft places. These spots would probably never have been discovered if they had not put the roller on the foundation. He also believed it was advisable in the long run to install plenty of concrete, to excavate the foundation to a uniform depth and to roll the foundation. These remarks applied to all types of rails.

In designing their track they had hoped to develop a track construction that might be divided into a sub-structure and a superstructure. They had concluded that a wooden tie entirely encased in concrete would be preserved against decay. That theory formed really the basis of the Chicago track construction. The life of the tie was such an important factor in track foundation that they had made a study of the preservation of timber and last year changed their specifications to call for a treated tie. They concluded that a chloride of zinc treated tie would be satisfactory for their purpose, because in a paved street the tie, particularly when imbedded in concrete, is preserved against the action of rain, and the salts are not leached out of the timber. It is a fact that where chloride of zinc is impregnated in timber it will preserve the timber against decay. In Chicago the standard treatment was the chloride of zinc treatment. The specifications, however, also covered the treatment of ties with creosote.

Mr. Weston referred again to the fact that a permanent foundation with a removable structure formed the basis of the Chicago track construction. They intend to preserve the tie from destruction from the action of the rail by the use of tie plates, because in street railway construction, where the track has to be built and the street closed before the cars can be put on the track, it is absolutely necessary to have the tie plate firmly in place before the cars go on the track. That fact prevented the use of a tie plate with corrugations, or the Goldie type of tie plate. Mr. Weston said he thought that type of plate was all right for steam railroad construction, where there was an open track and the construction train and cars could be run over the track, and it was not necessary to pave up to the track and there was a fixed grade immediately upon the completion of the track construction. To make the tie plate a part of the tie they fastened it to the tie with lag-screws, then if there was any movement of the rail it would expend its action on the tie plate and not destroy the fiber of the tie. In their investigation of the failures of track which had been laid in concrete foundation, they had found that in almost every instance the fibers of the wood had been destroyed from the action of the rail and that caused motion in the track and finally disintegrated the concrete. To have their track renewable, without disturbing the tie or foundation, they had adopted the use of screw spikes and hoped that if the ties were preserved against decay, and the tie plate filled its office, and the screw spikes were satisfactory, they would be able to remove the screw spikes and then the rails without disturbing the foundation.

He thought the specifications submitted by the committee for open hearth rail were a movement in the right direction. Their standard rail the past year had been the open hearth rail, and their carbon specifications were the same as recommended by the committee, that is from .60 to .70. The only point of advantage that they had been able to observe up to



the present time in connection with the use of open hearth steel was that in their electrically-welded joints they had had very much less breakage this year. In 1908 they had used a Bessemer rail and on some streets had about 1 per cent breakage. But up to the present time with the use of open hearth steel the breaks had been very much less by comparison and he thought that a point greatly in favor of the open hearth steel. Of course, they expect also to get greater life and greater wear out of the rails, but since these rails had just been laid in the track, he could not make any comparison.

In conclusion, Mr. Weston asked for the experience of the other delegates in regard to paving on concrete foundation. On their work, although they take a great deal of care, they had had trouble with the paving coming up along the rails, both on the inside and on the outside, or else the water seemed to get through the joints, although in some cases they had grouted and in some instances had filled the interstices with tar. The water seemed to cause some action which tended to force the sand up through the joints and then they would find small holes, like worm-holes, all through the pavement, and then the pavement would settle.

Mr. Clark of Cleveland, Ohio, said on that point that in all the track he had recently been laying he had been installing a 6-in. vitrified sewer pipe, buried in ashes. Ashes for this purpose were better than gravel or broken stone. This pipe was laid in the center between the tracks about a foot below the bottom of the ties, and connected about every 50 ft. with a man-hole, leaving an open space of about a foot wide. This they do not fill with concrete, but fill it with broken stone, which they carry across to the pipe. He had found that this would largely prevent a loosening of the blocks. All that was necessary was to take care of the water. The water was what caused the trouble. Their Clifton Boulevard track is alongside a grass plot which the company has to keep sodded. For 21,000 ft. on both sides of the street they had laid a 6-in. drain tile alongside the track, a foot under the ties. They then raised the track 3 in. and put 5 in. of slag under the ties, and paved the entire track with slag. This slag was rolled with a corrugated roller, with horses. They adopted a peculiar way for building the pavement. They put a 2½-in. bevel on the top of the rail and then sprinkled it with fine slag and rolled it with the corrugated roller. It was rolled probably 50 to 60 times, back and forth. They did not use a steam roller because it would not compact the pavement, but would push the material ahead of the rolls. The use of rollers for track beds was desirable but expensive.

R. C. Cram, of the Connecticut Company, said he was a firm believer in T-rails. Several cities in Connecticut had insisted, however, on his company using grooved rails for certain short sections of their track, but they were not so satisfactory as T-rails and it was harder with them to keep up joints. The section generally used is what is known as the Boston section. This rail is laid on a concrete stringer construction. The preferred form of construction consists of a T-rail, either 5-in. 80-lb. A. S. C. E. section for trunk line interurban work and even for small towns when used with a 5-in. or even a 6-in. macadam roadway; or else the 7-in. 95-lb T, Milwaukee section, that is, section 272. The only trouble with that rail was where a wheel tread wider than the head of the rail is employed. The speaker thought a 3-in. tread unnecessarily wide.

Victor Angerer, of Wm. Wharton, Jr., & Company, said that he thought Mr. Clark's point in regard to thickness of the web well taken. He also agreed with Mr. Clark in advocating a wide head rather than Mr. Cram, and thought the wider widths would be the coming thing. As to open hearth rails he believed that nobody had had the experience necessary to speak about them conclusively. He thought the same principle applied largely to the subject of specifications for steel rails. Although he had had experience with manganese

steel for the last 14 years he would still be unable to prepare specifications for manganese steel, because the subject would carry one into a field which is almost beyond the scope of ordinary practice. It was possible to design proper grooves for curves and the report on this subject in the way report was by one of his engineers. But the trouble was that railway companies usually ran different kinds of cars, with different wheel bases and different wheels and wheel flanges, over the same track, and it was impossible to take care of them all. It was not sufficient that the manufacturer should suit his products to the conditions, but the track man and the engineer should see that the track or special work was installed in accordance with the intentions. A great many track men were so accustomed to the idea that curves must be laid to wide gage, no matter what the rail or what the wheel flange was, and when they get a special work which had been fitted and constructed to the standard gage, they would pull the pieces apart to get a wide gage, and the result could easily be imagined. When the wheels and wheel bases of the trucks should be standardized, the curves could be made to suit. As long as companies run various wheels and various wheel bases over the same curves it is impossible to have a well-fitting curve and get the maximum wear out of it.

Mr. Clark asked Mr. Angerer if it was the practice of the companies to plane the head of the inside rail and the groove of the outside rail.

Mr. Angerer said that when the curve was not wide enough to accommodate the wheel flanges of course the groove had to be planed out. The practice of his company was to plane the side of the head of the inside rail and the side of the guard of the outside rail. That, however, he believed was not the general practice. Some of the engineers specified it, while others specified that the guard should be planed on both sections. They have adopted the practice mentioned because they wanted to preserve the full thickness of the guard of the inside rail, which gets the most wear, while the guard of the outside rail gets the least. Again, the head of the outside rail would be worn sideways as long as the inside guard was sufficient, so they wanted to preserve the full head there.

W. H. Evans of Buffalo did not see that it was really necessary that the rail should be as wide as the wheel tread, though the wheel should always be as wide as the head of the rail. Many companies throughout the Middle and Western States have to operate cars with wheels of sufficient dimensions to pass successfully over steam railroad lines. He thought it very desirable to use a wheel tread at least 3 in. wide rather than to try to get them narrower. In speaking of T-rails he said that Denver was probably the first city in the country to adopt T-rails, and had used nothing else since, and in his opinion the T-rail was largely responsible for the excellent track condition in Denver.

President Winsor asked Mr. McAloney to give some information about the weight of the cars used in Denver.

W. H. McAloney, Denver City Tramway Company, said that the heaviest car they had was 43 ft. 3 in. over all, with seating capacity of 52, and had four 43-hp motors, and weighed 43,000 lb. He thought the weight of cars was not the only factor in rail wear. A company could probably operate on the same section of rail or roadbed a 20-ton car stopping every 2 minutes, longer and with less damage to the track than it could a 15-ton car stopping every 30 seconds. The thrust of the car had a great deal to do with the wear to the track. In Denver there are a great many two-motor cars. The latest two-motor cars have two 65-hp motors each, carried on the No. 2 and No. 3 axles. Personally, he felt that with a two-motor equipment both motors should be on the rear truck, as greater leverage was thereby obtained in accelerating the car. Most engineers, he thought, took the stand that with only two motors, it was better to distribute the weight and the thrust, both in accelerating

and slowing, between the first and second trucks, but probably a little less power would be required with both motors on the rear truck.

Mr. Weston then asked if any delegate had had experience with the use of asphalt grout in pavement, as recommended by Mr. Simmons of Milwaukee.

Mr. Clark said that about three miles of track had been built in Cleveland with a board laid alongside the rail and the track kept about  $\frac{3}{4}$  in. away, but instead of using asphalt grout they had used a rubber cement which melts at a greater degree of heat. This cement was made in Chicago. While satisfactory when properly installed, great care has to be used in heating this cement. The best plan is to use cast iron tanks and bring the cement to a high temperature, being sure to have the tracks clean, because if there was any dirt in the cement it would not make a water-tight joint. If properly prepared and applied nothing can loosen it. Grouting breaks away. Hence Mr. Clark said that every 50 ft. he left an opening in the concrete about 1 ft. wide and filled it with crushed stone and ran this stone to his drain in the center of the track. If drain tiling were used, costing for a 6-in. pipe about 4.6 cents a foot, and the cinders were obtained from the powerhouse, this drain tiling laid should not cost complete over 15 cents a foot and might save \$15.

M. H. Bronsdon of Providence, R. I., though the entire question one of getting a good bottom for the track construction. The present tendency of his company was to space the ties closer, in fact, less than 2 ft., and there should not be any springing, provided the bottom is good and properly tamped. Many roads do not tamp under the rail and between the ties. This plan would leave a bad place for moisture to gather and cause pumping action to take place. Mr. Bronsdon referred to paving next to track which he had noticed in Denver. The concrete was carried clear over the track to form the top surface and the street proper, adjacent to the track, was paved with an asphalt surface. It looked like a desirable kind of construction.

Mr. Weston explained that his remarks did not apply to deflection in the track due to bad foundation or an insufficient number of ties, but to vibration. He thought that a destruction of the grout in the track could occur even if the track was perfectly stable as regards deflection. It could be caused simply by the vibration resulting from the operation of the cars.

Mr. Schreiber wished to point out that in the way committee report there were two issues which should be thoroughly understood. First, the use of T-rail in paved streets. This question could not be settled solely by the railway companies, but required the co-operation of the municipal authorities of the town or city in which the street railway operated. In the report the endeavor had been to show that in many instances T-rails are practical and desirable. Denver was an excellent example of this. Municipal engineers, however, held the key to the situation and would always have their own ideas, but if the railway engineers could convince the municipal engineers in cities where T-rail was not approved that it was not good judgment to demand a grooved rail like that in New York and Philadelphia, a very valuable work would have been accomplished. The second point was that it was practical to limit the number of rail sections and to standardize both T and girder sections. The desirability of standardizing rail sections could not be too strongly advocated. The large number of sections in use was absurd and unreasonable. Some of the sections required the examination of an expert to discriminate between them, but they might require materially different rolls. There were, he said, upwards of 200 sections in general use, and that meant that the steel companies were paying to store and keep in repair all of the different rolls required to say nothing of the money invested in these rolls. Eventually this extra expense had to be paid by the street railway companies. Of

course, with varying weights of rolling equipment, pavements and other conditions it was necessary to experiment so that there was an excuse in part for such a variety of sections, but now it was high time to eliminate a great number of sections. Standard rail sections meant better deliveries and cheaper steel, and this applied to all the accessories of track construction such as joints, braces, etc. He therefore hoped that the seven sections named in the report would be adopted as standards and further that the managements of the railway companies would begin to order rails for renewals according to those standards.

Referring to track foundations, Mr. Schreiber said that he used and always advocated a rolled sub-grade and a trap rock ballast under the ties, whether the track was open or in a paved street. In the street it was simply paved with concrete between the ties and the paving put on top of the ties. He did not use any concrete for foundations, because stone ballast was cheaper and gave just as good service. He did not have any settlement of the tracks, although fairly heavy cars were operated over it. With stone ballast also the important question of drainage need not be considered. There was a natural drainage in stone ballast, and water was practically unknown except in a few cases.

Mr. Schreiber had always been in favor of treating ties. During the past summer he had made extensive experiments in connection with the preservation of ties. He thought that zinc chloride was going to prove a very good treatment. In using zinc chloride, the ties were given a superficial treatment of high anthracite oil which was found in carbolineum. The Denver system used the same preservative. It was found advisable to treat the ties first with a high-class preservative, such as carbolineum, applied hot in an open tank, and then to place the tie afterwards in a cold bath in zinc chloride. This gave a heavy penetration. This treatment should not be confused with the Card process, which places the zinc chloride on the tie first and the creosote on the outside afterwards.

A. E. Bong, roadmaster, Utah Light & Railway Company, Salt Lake City, believed that the engineers should stand solid for the use of T-rail, and that finally by fighting for it the municipal authorities would sooner or later come to an agreement. As a matter of fact, the best track maintained and operated was of T-rail construction. In Salt Lake City nothing but T-rail was used. In that city there was some girder rail construction which has not proved a success. The ball of the rail wore out and the wheels cut down to the flanges, causing friction and requiring more power to operate the cars. He was using in salt Lake City a carbolineum-treated tie, and believe it was a good thing. It had proved so in the tests which have been made. Untreated ties had been placed in the same localities as treated ties and after five years the untreated ties had almost disappeared, whereas the treated ties were still in good condition and were good for a number of years to come. The matter of drainage was quite a problem. In some places where there were good sewers, it is easy to connect the track to the sewers. In Salt Lake City unfortunately there were few sewers and the drainage was always good. Referring to joints breaking down, he thought it was a good plan, wherever it could be done, especially in paved streets, to lay the joints up close. In the past he had laid track with allowance for expansion, but for a number of years in paved streets he had used no expansion allowance but made the joints tight as he could, and held them by cooling the rails with water.

The president then read a written communication from C. G. Young of New York City, bearing on the committee report.

W. H. Evans, Buffalo, N. Y., called attention to one point which he believed would develop as quite important. The desirability of moving electric railway equipment over the steam railroad lines on its own wheels had come to his attention. This practice would be increased materially as

the art advanced. This was a further argument for providing the necessary special work to take a wider-tread wheel. It was possible that a compromise might be reached between the standard steam railroad tread and the 3-in. interurban tread. He recently had experience with 3½-in. tread wheels on an interurban line. They ran through the main streets, and except for the trouble experienced with some of the older special work, which was ground out a little to clear the wider-tread wheels, little trouble was experienced and the cars have been running satisfactorily ever since.

Mr. Ackerman in closing the discussion referred to the objection raised by Mr. Clark that the width of the ball of the rail was not sufficient. The association had adopted as standard a 3-in. tread wheel, and also a 2½-in. tread wheel. This wheel was pressed on the axle to ¼-in narrow gage. With the 2¾-in ball of the rail an overhang of the wheel tread of ⅛ in. on either side of the rail is allowed. The committee thought this would not interfere to any extent with any pavement, and at the same time would give a full contact surface with the rail.

With reference to Mr. Weston's remarks relative to the preservation of timber in concrete he himself had had no experience. A few years ago he was led to believe that concrete would preserve the timber, and laid a considerable quantity of white oak ties in concrete, using 6 in. of concrete under the ties and bringing the concrete up to 1½ in. over the ties. That construction was laid in 1901. This year he had occasion to join to that construction at the end and to continue a further construction of the line. He found it necessary to make some excavation at the end of the rail and thought he would investigate the condition of the ties. He took up some half dozen ties and found them largely decayed. This he attributed to the fact that the concrete was somewhat broken in the thin shell that covered the tie, permitting some water to find its way down, and as there was no outlet for the water it resulted in decaying the timber.

With reference to paving blocks rising up along the rail, it had been his experience that the blocks would frequently rise along the rail for the first year after construction, and after a considerable amount of vibration the places seemed to be filled up, so that the blocks got a better seating, and not so much trouble was experienced later on. With reference to pitch filler and asphalt filler, any of these fillers would prevent the blocks from rising. The vibration of the track structure would permit some sand or dust to find its way down under the blocks and give a constant strain on each block which would push them up. In most cases with grout filler this did not occur as frequently as with pitch and asphalt filler.

With reference to the joints on girder and T-rails, he thought that the T-rail is susceptible of being joined a great deal better and more securely than any girder rail ever made. As to light and heavy traffic, a 16 or 18-ton city car operating under 6 to 10 minute headway could be considered as light traffic, and heavier interurban cars or heavier city cars operating more frequently as traffic which would call for the heavier rail. He disagreed with the statement that the frequency of the traffic did not affect the rail to be selected, for the reason that the rail surface was worn more rapidly than most persons realized. After a few years, if there was not sufficient metal in the ball of the rail the rail would be worn so thin that it would have to be discarded. For that reason frequency of service called for a deeper ball to give the rail longer life.

He had had some experience in maintaining a T-rail track on a foundation of concrete girders, 15 in. wide by about 13 in. deep, and 16 ft. long, placed close to the rail, with a space of 2 ft. between the ends of the girders. This was the first concrete foundation work which he had constructed in which no timber was used. It was laid in 1897, and at that time he was unfamiliar with that class of construction, in conse-

quence of which he endeavored to surface the concrete before laying the rail. The rail was then laid on the concrete, previously to which there had been placed anchor bolts in the concrete girders about 12 in. apart on either side of the rail. The rail was put on and thoroughly bolted down to the concrete girders, so that there could not be any movement between the two. A thin grout of cement mortar was filled around the base of the rail and over the anchor bolts, and a common Lorain section, 7-in. T-rail splice bar, was placed on the rail. Today that track was in as good condition as when laid. He attributed that to the use of anchor bolts largely. They seemed to hold the rail ends down, and prevent vibration between the ends. The pavement was granite block, which has had very little repairing done to it, and there had been no repairing of the track work.

Mr. Ackerman then presented the following recommendations of the committee for adoption as standards:

1. For track construction where the type of pavement will permit, as in macadam or other shallow pavement, your committee recommends the adoption as standard of the T-rail weighing not less than 80 lb. per yard adopted as "recommended practice" by the American Railway Engineering and Maintenance of Way Association, April 22, 1908.

2. For track construction for the heaviest service in connection with deep block pavements, your committee recommends the adoption as standard of a T-rail 7 in. high with a 6-in. base, 17-32-in web and a head 2¾ in. x 1 11-16 in. and weighing about 100 lb. per yard, as shown in the drawing marked Fig. 1, section A, of the report.

3. For track construction for light service, in connection with deep block pavement, your committee recommends the adoption as standard of a T-rail 7 in. high with a 6-in. base, 7-16 in. web and a head 2½ in. by 1 9-32 in. and weighing 80 lb. per yard, as shown in the drawing marked Fig. 2, section B, of the report, which is identical with the Lorain Steel Company's section 335 and the Pennsylvania Steel Company's section No. 277.

4. For track construction for heavy service in connection with deep block pavement on streets where the traffic is confined to the railway strip, or is so congested that the railway strip is continually used by vehicles, such conditions as exist only in cities of the largest class, your committee recommends the adoption as recommended practice of the half trilby girder sections shown on pages 122 and 123, Vol. 1 of the proceedings of this association for 1907, which sections were recommended by the sub-committee on rails and rail matters to the convention at Atlantic City in 1907.

5. In the matter of the use of open hearth and manganese steel rails and the increased width of gage on curves your committee wishes to report progress and recommends that the subjects be contained.

Mr. Ackerman moved that the recommendations be referred to the committee on standards with instructions to pass upon them as soon as it could consistently do so. The motion was unanimously carried.

William Roberts, Northern Ohio Traction & Light Company, referred again to the question of the wheel bearing on the rail. It was a matter of great surprise to him that the coefficient of friction between the wheel and the rail might vary from 25 to 40 per cent. That variation made a very great difference in the wear on the rails. Another matter which would be surprising to those who had not had actual experience was the weight of cars. Some three or four months ago it was determined in the City of Cleveland to weigh all cars coming into the city over the interurban roads. The weights that were given to the committee before the cars were weighed did not come up to the actual weight by six or seven tons. On weighing the cars it was found that some of them which it was thought would weigh 17 tons actually weighed approximately 20 tons, and those which it was thought would weigh about 33 tons weighed approximately 37½ to 38 tons. That had a great deal to do with the wear on the rail.

Mr. Roberts then moved that the paper be received with a vote of thanks to the committee. The motion was unanimously carried.

The meeting then adjourned.

## PRESIDENT WINSOR'S ADDRESS TO THE ENGINEERING ASSOCIATION

Denver greets our seventh annual convention with her bright sun, clear air, her wide streets and beautiful buildings, her rolling prairies and distant mountains! With true Western hospitality she throws open her houses to us, and for our convenience closes her streets to her own people. The City of Denver through her mayor and her citizens, through the Board of Trade and through the street railway company has done everything conceivable to prepare for our reception and to make our stay pleasant and profitable. We are glad that we brought our seventh annual convention to Denver.

The relations existing between our various associations are the very best. President Ely's far-seeing plans and tireless efforts, ably carried on by President Shaw, the hearty co-operation of affiliated associations, and the generous and thorough work of the Manufacturers' Association, have rendered possible this Denver meeting. The American Street & Interurban Railway Association, and its affiliated associations, the Accountants, Engineering and Claim Agents and the Traffic, is today big, alive and powerful; and the work that it has done for the street and interurban railways is tremendously to the benefit of them, their owners, the communities through which they operate, the people that they carry, and last, but not least, to the officers and employees, arousing an interest that makes our work a daily joy and profit.

It is a great pleasure to call to your attention the fact that all our reports were completed, published and in the hands of our members fully a month ago. Through the action of your executive committee, copies of these have been distributed to the associate members, and with the approval of President Shaw, extra copies have been sent to the member companies. In this way the committee work as represented by the papers has been widely distributed, so that you all come here with a full knowledge of the work that is before you, with the result, I hope, of a full and profitable discussion. The work of your committees has been most thoroughly and painstakingly done. The reports that have been presented to you, and which will come before you for discussion are most interesting and useful. I sincerely hope that you will second the work of your committees by doing your part, by entering into the discussions and making them as full and valuable as the papers themselves.

This year, for the first time, the preparation of papers has been entirely in the hands of standing committees. Our work naturally divided itself into distinct classes, so that the work of the various standing committees is clearly defined, and the personnel of these committees will largely be carried forward from year to year; the work will become simple and each year's work will supplement the work that has gone before. I believe that this form of organization is correct, and will work out to be very beneficial.

Gentlemen of the Engineering Association, we are extremely fortunate in being in a line of business which is not only in itself tremendously interesting, but in which we cannot work solely as individuals, each in his own small sphere. Each of us must work with the others in his own department, and with the other departments of his own road, and more fortunately still, he must work with the other roads, and with other engineers, and last, but not least, with the manufacturers. It is this that makes the work of the street and interurban railway engineer the most interesting that can be imagined.

In the past many companies, owners and managers have questioned the usefulness to them of our associations, and some, at least, have believed that it is not to their interest to pay dues, and to have their men take the time necessary to do our committee work and to attend our conventions. I believe, however, that this feeling has been pretty thoroughly

eliminated, and it certainly will be in the minds of those who attend this convention. The work done by our committees as shown by the reports speak for themselves. The standards that we have adopted, the practices we have recommended, and the complete information that we have got together, will work for a direct money profit to the railway.

There is another point in connection with our work, which seems to me fully as important as the papers, which are generally pointed to as the profitable work of our association, and this is the arousing in the individual an interest in his work. I believe that the best way, if not the only way, to get good and profitable work, both for the company and the individual, is to make the men interested in the business. Correspondence schools, night schools, lectures and all other aids to education are useless unless the individual is interested in his work. If we can arouse this interest the matter of education will naturally take care of itself. But without the interest there is no profit to one to study.

There is nothing that arouses this personal interest so far as I know, to the extent that it is aroused, as this association work. While a committee member gives up a very considerable amount of time to the association work, he gets fully repaid in the direct information he obtains from his investigation, but he gets a further profit, in my mind. The most important benefit is from his contact with his fellow worker, from his seeing what other people are doing, and from his aroused interest in his business. This is a matter that we should, as individuals, pay great attention to, and do everything that we can to arouse in the individual this all absorbing interest in his work.

I want to speak for the untiring and unselfish work done by your secretary-treasurer, Mr. Corning. He has served in his capacity now for several years, and under several presidents, and this year, owing to the financial condition in which the main organization found itself, has served without pay. I presume the work would have gone on if someone else had attended to it, but certainly his work has been of great profit to the association and to you, and has been appreciated by the officers and committees who have worked with him.

In conclusion I would suggest that in the future your association should continue the reports, on the same lines by standing and special committees, and should give particular attention to the question of standards, recommended practices and specifications. I believe that you can do a great deal of very profitable work on this last item—specifications. Your committees have offered for your consideration this year a number of specifications, and I believe that this work when more thoroughly thought out and organized, will be one of great profit to you.

In order that the coming sessions shall be what they ought to be, it is necessary for you to give your prompt attendance to the meetings, that you all come, and all enter into the discussions, and that you give of your spare time outside of the sessions to the examination of the wonderful exhibit that has been prepared for us.

## IMPORTANT CHANGE IN ACCOUNTANTS' ASSOCIATION PROGRAM

The executive committee of the Accountants' Association has decided to abandon the session planned for Friday morning and will confine the business to the meetings of today and Thursday. This change was made in order that the members may have the opportunity of taking the trip on the Moffat Road, which has been arranged by the Manufacturers' Association for Friday. A similar change was made in the program for the meetings of the Engineering Association. All the sessions of the Accountants' Association will be held at the Hotel Savoy instead of part at that hotel and part at the Rose Parlor, Auditorium building, as announced in the official program.

## TRANSPORTATION & TRAFFIC ASSOCIATION-- TUESDAY MORNING MEETING

The meeting was called to order at 10 a. m. by President Allen.

The report of the committee on interurban rules was read by C. D. Emmons, general manager, Fort Wayne & Wabash Valley Traction Company.

President Allen said that no amendments or suggestions which changed simply the typography or the grammatical construction of the rules would be entertained. Such changes would be submitted to the committee for consideration in 1910. He desired to repeat the burden of his remarks made on Monday that this was the first definite piece of work to come before the association for adoption, and he urged that it should be given careful consideration. He announced that the rules had been submitted to the executive committee of the American Association, and had been approved with the understanding that amendments might be made in the meeting.

The rules were considered by divisions and were not read.

William P. Rockwell, general manager, Syracuse & Suburban Railroad, Syracuse, N. Y., asked what was meant by the sentence, "Employees, in accepting employment, assume its risks."

Mr. Emmons replied that this was the same as the rule of the American Railway Association, and had been upheld by the courts.

### Time Tables

C. A. Coolidge, superintendent, Oregon Electric Railway, Portland, Ore., said that rule 84 "Superseding of Time Tables," had been discarded by the American Railway Association, a great many years ago. In this connection he also wished to say that the conditions affecting the operation of many of the Western interurban roads are such that they are required to operate under the American Railway Association's standard code of rules.

One reason for doing this was that they could take trainmen from the steam roads and put them to work on electric roads with the assurance that they were familiar with the rules. Under the code of rules recommended by the committee, a steam railroad man would be absolutely lost. The interurban time table rules particularly give a steam railroad man considerable difficulty. The electric railways on the coast would be compelled to follow the code of the American Railway Association, regardless of what the Transportation & Traffic Association adopted.

Mr. Emmons replied that a careful study of the American Railway Association rules on time tables and the rules in the committee report on the same subject would show that there was not a great variance. The steam road rules provided that on the superseding of an old time table by a new, a train running, for example, as No. 8 under the old time table could assume the rights of No. 8 on the new schedule and proceed under the new time table. Under the interurban procedure all that it was necessary to do was for the dispatcher to give that train an order to run as No. 8 under the new time table. He did not believe that the old time table should in any way affect the new schedule going into effect.

Mr. Coolidge moved that rules 84 and 85 of the proposed code be amended by the substitution of Rule 4 of the Standard Code of Train Rules of the American Railway Association which reads as follows:

Each time table from the moment it takes effect supersedes the preceding time table, and its schedules take effect on any division or subdivision at the leaving time of their initial stations on such division or subdivision, but when the schedule of the preceding time table corresponds in number, class, time of leaving, direction and initial and terminal stations, with the schedule of the new time table, the train is authorized by the preceding time table to retain its train orders, and assume the new schedule with the corresponding number of the new time table. Schedules

on each division or subdivision date from their initial stations on such division or subdivision, and not more than one schedule of the same number shall be in effect on any division or subdivision.

W. R. W. Griffin, general superintendent, Rochester, N. Y., Railway Company, offered an amendment to the motion, that the American Railway Association rule be adopted in the code as an optional rule.

J. D. Wardle, superintendent Cedar Rapids & Iowa City Railway & Light Company, said that his road had been operating under standard steam road rules ever since it was organized six years ago. There has been no rule that has been harder to understand by the men than rule 4. Every change of time table necessitated special instructions, to all new men particularly, and especially to those who had not been well acquainted with steam road rules. He suggested that the interurban roads which operate under steam road rules might embody such a rule as a special time table rule, if desired.

Mr. Emmons called attention to the fact that most of the electric roads put their schedules in effect at an hour when there were no trains upon the road.

Mr. Griffin said his road was operating under the standard code at the present time, and was getting men from the steam roads. He had but little trouble handling those men because the rules used were practically unchanged. He wanted to see the interurban code rearranged and renumbered to correspond with the numbers of the American Railway Association standard code. He, for one, would not use the code with the rules numbered as they were.

The motion that Rules 84 and 85 and Rule 4 of the American Railway Association standard code should appear in the interurban code and be optional as to which rule should be used, was lost, 20 to 13.

### Movement of Trains

F. A. Boutelle, superintendent Puget Sound Electric Railway, Tacoma, Wash., said in referring to Rule 203, that the Puget Sound Electric Railway operated entirely under standard steam road rules. Rule 203 provided that where trains come from a branch line onto the main line at points where no train register is maintained, the conductor or motorman should ask the dispatcher whether all trains due had arrived or departed. Asking the dispatcher a question was equivalent to giving a verbal order, and was decidedly unsatisfactory. He contended that it was unsafe to take any verbal orders or give any right of track merely by word of mouth over the telephone. His practice was to issue an order the same as a clearance, being in effect a 19 order, giving to all trains a positive order stating what trains have passed and what trains have not passed. He suggested that some change be made in the rule to make it obligatory on the train crew to have positive orders or positive clearance. In rule 203a he took exception to the explanation of "protected by flag." On the coast they had a good many fogs and handled heavy freight trains. All Puget Sound Electric passenger trains are made up of two and three cars and are run at high speed. Motormen and conductors were required to take the same precautions as the steam railroads in preceding a train at a safe distance at all times with a flag. He did not believe it was safe to run at high speed within the range of vision as expressed in the rule. He believed that if a train has no rights on a main track it should be protected absolutely.

Mr. Emmons explained that the intent of rule 203a was that an opposing train should run only so fast that it could stop in one-half the range of vision on straight track. This was supposed to take care of fogs. The committee endeavored to make the rule as concise and safe as possible without making it as lengthy as some rules have been made to cover a situation of this kind. By adopting the wording as given in the rule and then providing for flagging around curves, it was thought trains would be protected under all conditions.

Mr. Boutelle thought that the wording of the rule gave the trainmen too much discretion. He believed that the rules for protecting trains should be made certain and definite.

P. P. Crafts, general manager Iowa & Illinois Railroad, Clinton, Iowa, presented an amendment to rule 219, which relates to the protection of trains when stopped on main line between stations. He could find no point in the rules where the proper procedure to be followed by the flagman is laid down. The amendment to rule 219 was as follows:

In case a train is stopped on the main line between stations or is delayed under circumstances under which it may be overtaken by another train, the CONDUCTOR MUST IMMEDIATELY GO BACK with stop signals, not less than fifteen hundred (1,500) feet, and at night drop a red fusee five hundred (500) feet in the rear of train. Day stop signals will be two torpedoes and a red flag, night signals two torpedoes, two red fusees, red and white lanterns. Place one torpedo on the rail and remain until another train arrives or until recalled. Motorman of any approaching train will promptly acknowledge signals and stop.

When conductor is recalled and no approaching train has arrived, light a red fusee and place a second torpedo two hundred (200) feet nearer his train than the first and return.

On exploding one torpedo approaching train will stop, then proceed with extreme caution; if second torpedo is exploded motorman will know that flagman has been recalled and will proceed cautiously, keeping a sharp lookout for train ahead. Conductor of any train stopped by projecting signals, will protect his train in the same manner as heretofore described.

When necessary to protect the front of a train the same precautions shall be taken by the motorman or a flagman, who may return to his train, after placing signals, to make necessary repairs. If necessary he may call in the conductor to assist him.

The dispatcher shall be immediately notified of a stop between stations. When ordered to proceed run train to front signals, if any, and remove same before proceeding.

Mr. Crafts explained that this rule was copied almost word for word from the rules of the Chicago & Northwestern Railway. He quoted a newspaper clipping outlining the accident record of the Pennsylvania, the Burlington and the Northwestern Railroads for the fiscal year, 1908. None of these roads had an accident in which a passenger was killed. A part of this safety, of course, was due to the use of block signals, but rear-end collisions are the cause of many deaths of passengers and trainmen, and he thought the efficiency on the Northwestern, on which this amended rule was used, indicated that part of the efficiency was due to the provisions of this rule.

Mr. Rockwell thought that '1500 ft.' was an unnecessarily long distance to send a flagman back on a straight track. He believed in making only such rules as could be absolutely carried out.

Mr. Crafts agreed that perhaps 1000 ft. would be safe on most roads.

Mr. Emmons said that the committee and Mr. Crafts had had a long discussion on the subject at Washington. The committee felt in adopting the American Railway Association rule, which was very concise and definite, that it was doing the best thing. There appeared in large type in rule 219, these words: "Conductor or flagman must go back immediately with red signals a sufficient distance to insure full protection, not less than 1000 ft."

The amendment was lost by a vote of 30 to 2.

Mr. Coolidge expressed the opinion that rule 210 was altogether wrong in specifying the spacing of trains by distance. Trains should be spaced by time, by means of fusees and torpedoes, and not by distance.

C. E. Morgan, general manager, Indianapolis, Crawfordsville & Western, referred to rule 212 and moved that it be eliminated, as he believed it to be a dangerous rule. Rule 213 covered all situations sufficiently.

Mr. Emmons said that he believed rule 212 was an essential rule in the operation of a road.

The motion of Mr. Morgan to eliminate rule 212 was lost, 19 to 14.

Mr. Boutelle moved that rule 203 be amended to read as follows:

A train must not leave its initial station on any division, or a junction, or pass from double to single track, without order or clearance, and until it is ascertained that all superior trains due have arrived or departed.

Where a train register is maintained it shall be the duty of the conductor to register and to note carefully whether all trains due have arrived.

If in such case the motorman or conductor cannot reach the dispatcher, the train will proceed on time table rights "fully protected by flag in advance of the train," then call from all succeeding telephone stations until he has succeeded in communicating with the dispatcher.

He also moved to eliminate rule 203a. The amendment was lost, 16 to 3.

#### Rules for Movement by Train Orders

Charles R. Henry, president and general manager Indianapolis & Cincinnati Traction Company, objected to rule 256. He thought that there should be eliminated from this rule the provision that the conductor should read the order back to the dispatcher. This was a matter upon which the Indiana roads had had a very full discussion at the time of getting up a code of rules with the State Railroad Commission. It was decided in that conference it should be optional with each company whether they should put in that provision. There was only one road in the State which had adopted that portion of the rule. The other companies believed that if the motorman read the order and the conductor took the order, the man not taking the order reading it carefully, that should be the end of it.

Mr. Emmons said that his road was the only one in Indiana using the double check. He felt that it was the only way to be absolutely sure that both men get the order and that they fully understood it. His dispatcher had rigid instructions to refuse to complete an order until he got the second voice over the telephone. The objection to it was the time that it took. He got trains over the road about as fast as the other companies and found no difficulty on account of the extra time needed. The committee was not a unit on this point.

F. W. Coen, general manager Lake Shore Electric Railway, said it had always been his idea that the train order should be received by the conductor. The place for the motorman was on his car, and he should stay there. In 10 years of operation he had seen nothing that indicated the necessity of having both receive or repeat a train order.

Mr. Henry moved to substitute the following procedure to obtain orders at telephone stations in rule 256:

The motorman or conductor, whichever is most convenient, will call the dispatcher, who will give such orders as are necessary, whereupon the one taking the order will write the same plainly, on blank provided for the purpose, with carbon copies provided for that purpose, and when he has finished writing the order, he will repeat it to the dispatcher, who will complete the order if correct, by giving the initials of the superintendent or other designated authority, and the time of completion, which initials and time shall be promptly written on the order. When the order has been properly completed, the one receiving the order shall then sign his name to the order, after which the order will be in force and effect. The one who has not taken the order will then read the order aloud in the presence of the one who has taken the order, and sign his name to the order, taking one copy for his use until the order is fulfilled.

He believed Mr. Emmons' rule took unnecessary time, and that the dispatcher paid no attention whatever to the second reading.

Mr. Griffin pointed out that any time a train movement was made other than as provided by the time table an element of danger was introduced. Any dispatcher's order was dangerous and he did not believe they could be hedged around with enough safeguards. He had known it to happen that one man would receive and write an order and repeat

it back; when that order was read by a third person it was not written as it had been given. He thought the third party should intervene in every case.

J. C. Calisch, Buffalo & Lake Erie Traction Company, said he would rather have the message repeated by the second man to the dispatcher and know that it was on record than to take the chance that the motorman might not read the order to the conductor.

S. W. Cantril, superintendent of transportation, Denver City Tramway Company, was opposed to dividing the responsibility between the motorman and the conductor. He preferred to have the motorman deal with the dispatcher.

H. A. Nicholl, general manager, Indiana Union Traction Company, read a letter from J. N. Shannahan, the chairman of the committee, who, since the report was printed, had changed his opinion on rule 256. Mr. Shannahan suggested the following rule:

Procedure if 31 order is given:

The dispatcher will give such orders as are necessary to the motorman, who will write the same plainly, and without unauthorized abbreviation, on the blank provided for that purpose with sufficient carbon copies for each person addressed and when he has finished writing the order he will read it to the dispatcher, who will O. K. the same, if correct. The motorman will then read the order to the dispatcher and if correct, the dispatcher will complete the order, by giving the initials of the superintendent, or other designated authority, and the time of completion. The time of completion and the word "complete," together with the signature of the conductor, shall be promptly written upon the order by the conductor, after which the order shall be in full force and effect. The conductor shall personally deliver copies of the order to each person addressed.

Both Mr. Henry's and Mr. Shannahan's amendments were rejected on vote.

Mr. Henry then moved to strike out "procedure under 19 order" as given in rule 256.

Mr. Henry made another motion that his first amendment as originally read be put in the rules as optional, alongside of the rule adopted.

J. H. Pardee, operating manager, J. G. White & Company, thought that there should be a provision that the interurban code was subject to the rulings of State Commissions or of laws or of municipal regulations.

The motion of Mr. Henry was carried by a vote of 19 to 17.

Mr. Griffin moved to amend rule 258 as follows: "To issue train orders at stations where there are operators or agents, the dispatcher will instruct the operator or agent to display a stop signal for the motorman and conductor to stop for orders. The motorman and conductor must not pass a station where such signals are displayed without reporting to the agent or train dispatcher, and until such signals have been taken down, removed or cleared.

"The dispatcher will give such orders as are necessary to the operator, who will write the same plainly and without unauthorized abbreviation on a blank provided for that purpose, with sufficient carbon copies for each member of the crew, and when he has finished writing the order he will read it to the dispatcher, who will O. K. the same if correct. The operator will thereupon sign his name upon the order and hand the same to the conductor of the train, who will then read the order to the dispatcher, and if correct the dispatcher will complete the order by giving the initials of the superintendent or other designated authority and the time of completion, which initials and time of completion, together with the signature of the conductor, shall be promptly written upon the order by the conductor, after which the order shall be in full force and effect."

Mr. Griffin's amendment was not seconded.

Mr. Coen thought rule 440, relating to ejections, might involve some legal difficulties because it left to the discretion of the conductor where a passenger should be put off the car.

Mr. Emmons said that the paragraphs in this rule were submitted to the general counsel of most of the companies with which the members of the committee were connected, and it had also been taken up and discussed with counsel by the chairman of the committee. He felt that it had been fully considered from a legal standpoint and was all right.

Mr. Pardee offered the following resolution:

Whereas, the committee appointed at the last meeting of this association has prepared and reported a certain code or set of rules governing the operation of electric interurban cars, which code is intended to include such general rules as represent the best and most modern practice in electric railway operation, and

Whereas, this association has duly and carefully considered and amended the same in some particulars, and

Whereas, it is for the interests of the members of this association that the association adopt, approve, promulgate and recommend a code of rules which shall be considered the standard code, except in so far as it may, in specific instances, be necessary to omit, add to or change rules in order to conform to state or municipal laws and regulation or to local conditions.

Now, therefore be it resolved, That the rules reported by the committee and as changed, omitted or amended at this meeting be the standard code of rules of this association for the operation of interurban cars, until such rules may be duly amended or changed at a meeting of this association, and

That this association request its members to adopt this standard code of rules for the operation of interurban cars on their respective railways except insofar as such rules may conflict with State or municipal laws or regulations or be unwise or inapplicable on account of local conditions, and

That the committee on Interurban Rules be continued to report at the next meeting of the association such proposed changes or amendments as may seem wise or necessary.

Mr. Coolidge moved an amendment to the resolution that the standard code of train rules of the American Railway Association be substituted for the code as proposed.

C. J. Franklin, general superintendent, Portland (Ore.) Railway, Light & Power Company, seconded the amendment made by Mr. Coolidge. He said the rules of the American Railway Association were the fruit of many years of study by steam railroad men of the operating conditions with which they have had to cope during these years. He did not mean anything disrespectful to the committee, as he realized that the committee had worked hard. He asked, why not adopt the American Railway Association Rules in the beginning and insert such other rules as were necessary to meet local conditions?

Mr. Pardee explained that the amendment provided that the standard code of the committee be adopted, with such changes as would meet the electric operation of street railways. The standard code of the American Railway Association could not be adopted bodily, and would have to be changed and worked over to suit the conditions of the individual electric railways. That was exactly the work which the committee had been doing for the past two years.

The amendment of Mr. Coolidge was lost, 32 to 3.

The resolution offered by Mr. Pardee was carried by a vote of 41 to 3.

Mr. Coolidge then moved that the committee on rules be instructed to confer with the committee on rules of the American Railway Association, with the idea of making any changes that may be deemed desirable in either code of rules.

The motion, after some discussion, was unanimously carried.

President Allen appointed a committee, with Mr. Coen as chairman, to frame suitable resolutions to be presented at the meeting on Thursday morning thanking the committee for the work it had done.

The meeting then adjourned.

## REPORT OF THE COMMITTEE ON EDUCATION\*

By H. H. Norris, Chairman; R. E. Danforth, A. S. Richey and  
D. C. Jackson

The committee on education has devoted its attention during the past year to a study of educational methods by which the efficiency of the employees can be increased. This study has shown that educational work must be divided into two distinct classes.

(1) That directed to preparing properly educated young men for positions of executive responsibility, and

(2) That designed particularly for raising the grade of work done in all departments.

At the first meeting held, a circular letter was drafted for the purpose of obtaining data as to the present practice of the member companies along the lines mentioned. This letter was afterward sent out, and a large number of replies were received.

Since its appointment the committee has devoted the larger part of its attention to apprentice or cadet courses, designed particularly for technically trained young men. These courses are being developed by several of the member companies, the Metropolitan Street Railway Company of New York being a conspicuous example. The practice of the Public Service Railway Company was described in last year's report from this committee. This company continues the practice therein described, having about 20 technical graduates employed in the various departments according to a fixed schedule by which each so-called cadet is given work for a stated time in each of the operating departments. Ten of these cadets have been with the company over one year and, in several instances, show good promises of developing into excellent operating men, several showing marked ability in the mechanical department. After one more year's service, when these cadets will have covered the entire course, they will be assigned to the departments in which they show the greatest ability.

The company does not anticipate that every cadet will make good. Those who are found unsuited for the railway business are weeded out as their weaknesses develop. The head of each department devotes sufficient time to the cadets employed under his direction to be able to pass upon their qualifications. In order to describe the relative merits of each cadet their characteristics are divided into 10 points, each point counting 10 per cent; the total being 100 per cent. The head of the department expresses his opinion of the value of each cadet by the percentage system given him on his record while in his department. Those under whom cadets have been employed during the past year are well pleased with the manner in which they perform the duties assigned to them and their readiness to learn practical methods.

Before leaving for the time the matter of cadet corps, the committee desires to suggest to the Association for purpose of record the following resolution:

Whereas, The plan as outlined by the educational committee and put into practical use by certain member companies, under which technical graduates are systematically given opportunity to learn the rudiments of the various branches of the electric railway business has met general approval, and

Whereas, The association believes that the training obtained in the course as outlined is that best suited for preparing young men for responsible positions, before they are assigned to regular or permanent work in particular branches of the business, therefore this association hereby approves the plan, and recommends it to the various member companies, for the purpose of putting young men in line for responsible executive positions.

Having called attention to the importance of this matter, the committee has felt during the past year that the large body of young men who have not had the advantages of a

technical education should now receive consideration. The committee was gratified at the response to its circular addressed to the member companies, the demand for a correspondence course being stated as practically unanimous. Out of the 75 replies 56 were entirely favorable to such a course, four did not believe it would be useful to them, while the remainder did not commit themselves one way or the other. The last named either failed to reply to the questions or in a few cases they doubted if the plan would be of help to them.

The committee asked for an estimate of the number of young men who might be interested in such a course if it could be established. The estimate returned by 50 companies was over 500, or an average of 10 per company. This response has convinced the committee that such a course has considerable possibilities. It affords a new channel through which the Association may serve its members.

### The Suggested Correspondence Course

As indicated in the circular letter, it is proposed that sets of questions be sent out at regular intervals to the young men enrolled in the course. These questions would be so framed as to require the students to use every possible means for securing information. The students would be forced to educate themselves by means of their actual surroundings. The power house, the car barn and the shop may furnish excellent educational material. Foremen and superintendents are always pleased to answer intelligent questions, and hence they could furnish much useful information for the students. The companies could place at the disposal of the students a few books and periodicals, the questions of which would encourage the latter to study.

Replies to the questions would be sent into the central office where they would be carefully examined, revised and returned for correction if necessary. In the central office the service of a competent assistant secretary would be required. He would work under the general direction of the general secretary, who would be available for advice and suggestion.

Commenting editorially upon this proposed plan the *Electric Railway Journal*, July 3, 1909, remarks:

Attention has been directed from time to time in these columns to the work of the committee on education of the American Street & Interurban Railway Association. When this committee was appointed last year there was no distinct idea in the minds of its members as to its exact functions. The first duty was to determine the lines of work which were feasible and which would be of greatest service to the member companies of the association. As the individual members of the association had previously shown great interest in a study of methods for recruiting the executive and engineering forces of their companies, this subject was considered first. The time between the appointment of the committee and the date of the convention of 1908 was so short that it was only possible to obtain incomplete information from a few companies which were known to have successfully inaugurated definite plans for educational work. No recommendations were made in the 1908 report, as the data were not complete enough to enable the committee to draw conclusions.

During the past year the committee has been accumulating a large amount of information, which probably will result in the formulation of several important recommendations to be presented to the association. The graduate apprentice plan has had a gratifying development and the member companies are regarding with increasing favor the systematic recruiting and training of technical graduates in electric railway work. It will be a number of years before the results of the application of this plan will be evident, but one confidently expected result is an increase in the number of technically trained men occupying positions of executive responsibility.

In addition to the work on the apprentice scheme, the committee has devoted attention to the problem of helping the large body of young men who can never hope to secure a college training. These young men must educate themselves while holding their present positions. Many of them only need encouragement and guiding in this commendable educational process. It is the intention of the committee on education to formulate a plan to supply the incentive to study and to suggest lines of profitable application to stu-

\*Abstract of report read before the American Street & Interurban Railway Association, at Denver, Colo., Oct. 4, 5, 6, 7 and 8, 1909.



dent employees. The committee believed the establishment of a correspondence course under the auspices of the association would bring about the desired end, but had some doubt as to whether such a plan would meet with the approval of the member companies. Since the replies have been received to a circular letter sent out on April 10, asking the member companies their opinion as to the value and need of such a correspondence course, all doubts have been removed. With practical unanimity the plan has been endorsed. One company writes:

"We feel that anything which can be done to increase the knowledge of employees must not only benefit them, but also the company, in making it possible for the company to secure a higher standard of efficiency of the work of the men. If there is any organized movement of this character it will raise the standard of efficiency of street railway employees in general."

Replies from other companies have been equally encouraging, and it now remains to ascertain the practicability of such a plan by putting it into effect.

It is understood that the committee will recommend that a correspondence course be established by the association, with the stipulation, however, that a financial plan be devised by which no additional burden shall be placed upon the treasury of the association. It is probable that it would be necessary to appoint an assistant secretary, who would have charge of the educational work and devote his entire time to it. No doubt such a plan would cost a considerable sum of money annually to maintain, but if those in favor of the scheme can demonstrate that it will produce the desired results the money will be forthcoming.

There is no agency which can do this work more efficiently than the association as at present organized. The general secretary is in a position to give to the suggested new department his advice and general oversight. If a man with the proper qualifications can be secured to manage the details, there is not any question as to the ultimate success of the plan. He must be a practical railway man, who is in hearty sympathy with the desire of young men for advancement and education. He will need tact and patience, and will find it necessary to frequently visit his pupils and their employers in order to maintain a close personal interest in them. He must be one who has worked in the shops and car barns as a boy, and who can think and feel as boys do.

In order to make the whole matter of the correspondence course perfectly definite, the committee at its second meeting, framed the following suggested resolutions:

Whereas, The replies to inquiries received from member companies clearly demonstrate that 56 companies, being 80 per cent of those replying to them, are favorably interested in a correspondence course of instruction as outlined by the educational committee, therefore be it

Resolved, That the association approves the plan as outlined by its educational committee, provided that the expense of such a course be not met out of the regular funds of the association, and be it further

Resolved, That the matter be referred to the executive committee with a request that the details of the plan be worked out, and that it be put into operation if and whenever they deem it practicable.

The committee wishes to emphasize a few points in connection with its investigations.

#### Conclusions

(1) That the companies have a responsibility to themselves and to the young men in their employ, to furnish these young men with every opportunity for making the most of their natural ability and their acquired experience.

(2) That it is not a necessary part of their educational scheme outlined by the committee, that the company utilizing one or the other should be a large one. Either scheme may be adapted to the needs of a single individual.

(3) That by continuing the educational process the companies will produce a reflex action upon the schools, and will influence them in improving their methods.

Following are a few of the helpful comments made by officers of the member companies, who gave the committee's request careful attention:

We have always taken young men in as apprentices, changing them from one department to another until they have a working knowledge of all branches. This apprenticeship is for three years. They start in power station and subsequently work in car house, on line construction and on meters. While in car house they are taught to run both ends of a car as conductor and motorman. Being a small company these men as soon as their intellectual wings are grown usually fly to some place where they can earn more;

several are now occupying high places in the electrical business.—J. W. Cartwright, Jr.

The difficulty is to make a practical operating executive out of a man with a technical education, but when you get a good combination of the trained with the practical you have the ideal, and the one that the present condition of economical operation demands. I, myself, am of the "old school," in the class with the old street car horse, but think I have sufficient sense to appreciate present needs.—J. F. Calderwood.

We feel that anything which can be done to increase the knowledge of employees must not only benefit them, but also the company in making it possible for the company to secure a higher standard of efficiency of the work of the man, and that if there is any organized movement of this character it will raise the standard of efficiency of street railway employees in general.—R. S. Goff.

Our business involves the questions of franchises, public policy, procurement of business, financing, accounting for and collecting revenues, maintenance, operation and construction. There is so much in the business that the departments are co-ordinate rather than subordinate. We need that a comprehensive scheme be submitted embracing all departments and sub-departments.—Isaac B. Smith.

Invariably the young technical graduates move about from place to place following the more entertaining parts of construction work, and it seems hard to get them down to studying the operation side of the work. Our young men trained up through the car and power house, who have a good grounding in mathematics before starting work, invariably take precedence over them in handling the various duties. Among the non-technical men employed throughout our engineering works there is a persistent search made for knowledge, which fact is made known by the large number and the great variety of questions asked.—Chas. E. Taylor.

Several of our employees have taken such an apprentice course. Men with an ambition to study and acquire a full understanding of the apparatus and equipment which they handle are extremely valuable to small proprietors. Such proprietors cannot afford to employ specialists.—P. P. Crafts.

Give the employee training enough so that he can fit himself for one place higher up at a time. Then, if in that position he proves capable, train him for the next step. Don't give him so much at any one time that he will be dissatisfied with advancement one step at a time, for then he is discontented and of not much use.—R. R. Smith.

My judgment and experience indicate that technical men are on the whole not particularly adapted to the condition of street railway service. They are of value in a limited number of positions, and to a limited extent. Generally, they don't know the value of a dollar, are lacking in initiative and inventive ideas, have but little executive ability and do not widely harmonize with other workmen. Much of their knowledge is useless, they have not acquired habits of industry, lack in physical stamina and manual skill and cannot produce results rapidly and economically. Technical training is of more value in the complex conditions of a large urban system than in the ordinary street railway system. As a college graduate, with long experience in employing technical men, I am firmly convinced that most of the best railroad men are graduates from the university of hard knocks. Our systems need men of executive force, men who can do things rather than men who merely know and want some other fellow to do. Men who grow up in the service are as a class more dependable, efficient and contented than the technical man, who is apt to think his knowledge is not appreciated.—W. J. Kelly.

The committee's plan shows careful consideration of the subject, and seems to meet the reasonable requirements of the service at this time. Undoubtedly further experience will suggest improvements, but for the present, I would give the proposed plan a thorough trial before suggesting changes or improvements. I endorse most heartily the proposed correspondence course. Besides the technical knowledge that will be disseminated concerning the duties, position and obligations of the employees, it will lead to the building up of a strong organization, loyal and true to their employers, and capable of the best service obtainable in their respective lines of business. It is a long move in the right direction.—J. N. Moyer.

There are no technical school graduates in the service of this company, but we all study as well as work. The men here who hold the best jobs have all worked their way up to their positions, and it would be contrary to the spirit which prevails here to put any newly-made "B. S." on top of any of our men. The plan of instructing men, engaged in electric railway service, in study and research appeals to me, but I should engage a graduate, put him at the bottom, and let him secure a "daylight" run through the established process.—A. H. Rogers.

The plan outlined would, I believe, be a good start in the right direction, and after being followed for a time such alterations could be made as might be suggested by the experience, thus gained.—G. O. Nagle.

We have no trouble in getting technical men started. It must be borne in mind, however, that it is necessary for the company to "make good" to the man, as one failure to give an opportunity to the man who is justly entitled to it will upset the entire scheme.—C. Loomis Allen.

I believe that the proposed course in conjunction with the apprenticeship system is the ideal proposition. I am sufficiently interested myself to want to know more about it.—W. P. McRay.

It might be well to consider a proposition for the American Street & Interurban Railway Association to organize a correspondence school in connection with the office of secretary and treasurer to be maintained by the association. There are a large number of young men and boys now engaged in railway work who would be glad to take advantage of the opportunity to gain some technical knowledge. Young men and boys, who are employed by companies which are members of the association, would be eligible for membership, provided they received a recommendation from the president or general manager of the company with which they are connected. The details of this arrangement, of course, can be worked out along the lines suggested by the committee in reference to the correspondence course. I also believe that books of reference and information pertaining to street railway construction, maintenance and operation should be kept in the club rooms or car house lobbies for the use of students, motormen, conductors or other employees, also that the leading technical and street railway publications be placed at the disposal of the employees in the reading-rooms or lobbies.—E. G. Connette.

### HIGH CLASS VAUDEVILLE BY AMATEURS

Honored by the presence of Governor Shafroth of Colorado and Mayor Speer of Denver, who sat in a box with President Shaw of the American Association, the fifth annual vaudeville show of the supply men was a distinct success. The Tabor Grand Opera House was packed to overflowing, many standing up, and the audience, including many ladies, was eager and interested. The supply men gave a good show, and they were ably assisted by the Denver City Tramway Troupe and Band, every member of which is regularly employed by the local company. The Denver men very kindly volunteered their services.

The opening feature consisted of a burlesque female baseball team, and the girls played a weird game, said to be umpired by "Mr. Whipple." These merrymakers were chased from the stage by a chorus of farmer supply men, who, in a barnyard setting, sang "The Old Oaken Bucket" and other old songs, Mr. John H. Thomas of the Standard Paint Company, New York, taking the solo parts. The closing song was "Where Is My Wandering Boy Tonight?" The "boy" was found, fortunately, and the girls rushed on the stage in the general rejoicing, and there was a lively dance, in which all joined.

Messrs. J. J. Kreidler and F. C. Nester, employees of the Tramway Company, did a laughable "Dutch comedian" act, and then Charles C. Peirce of the Boston office of the General Electric Company, vice president of the American Street & Interurban Railway Manufacturers' Association, made a little speech. The general entertainment arrangements are under the direction of Mr. Peirce, for the association, but he gave all the credit to Chairman A. L. Whipple of Forsyth Brothers, New York, for the faithful work which is being so amply crowned with success.

Mr. Thomas, who has a fine voice and a good stage presence, sang two songs most acceptably, and A. J. Price, a Tramway conductor, gave a clever piano-playing act, winding up with playing a quick rag-time air on the piano after the keys had been covered with a cloth. One of George Ade's stories, "The Attenuated Attorney Who Rang in Associated Counsel," was told with good effect by A. V. Thompson of the San Francisco office of the General Electric Company.

When the curtain went up on the second part it disclosed a regulation old-time black-face minstrel troupe, with George H. McCauley, motorman, as interlocutor, C. A. J. Price, conductor, and J. J. Kreidler, motorman, as endmen. There were new patriotic, sentimental, pathetic and comic songs, sung, and sung well, by E. F. Smith, F. S. Nester, V. A. Thodpe, E. W. Neighbor, H. O. Nelson, J. J. Andis, and J. J. Foster as well as by the others mentioned. All are conductors or motormen of the Tramway Company.

John H. Stedman of Rochester, N. Y., and of the Ohmer Fare Register Company, gave "L'Habitant Things and Other Things" in his own inimitable way. As a raconteur and poet, Mr. Stedman is the pride of the association, and he upheld his reputation.

Following came the olio of the minstrel show, with selections by the Denver City Tramway Quartette, consisting of W. L. Albin, V. A. Thorpe, Theodore Sparks and R. DeGerminey. The singing was first-class, and, like all the features of the show, was liberally applauded.

A little comedy, "A Dutchman's Mishaps in a Hotel," written by J. J. Kreidler, and with all the parts, as well, taken by Tramway employees, came next. It was really amusing and greatly enjoyed by the audience. Then came the stirring finale, with the flags of Mexico, Canada and the United States borne in by girls, while the Denver City Tramway Band played the national airs. As the musicians gave "The Star-Spangled Banner" the curtain, bearing a representation of the handsome badge of the A. S. & I. R. A., fell on a performance, which, if somewhat long, had been thoroughly enjoyed and for which all present felt indebted to the supply men and their Denver collaborators.

After the performance the Denver Tramway men taking part in the show were entertained at a "Dutch Supper" by the entertainment committee at the Kaiserhof.

### THE HUMBLE NICKEL

Let the Englishman boast of pounds, shillings and pence,

The Frenchman delight in his francs.

Marks, pfennigs and scudi, lire, florins and sous,

Each does very well as it ranks.

But the purchasing power of these coins is mere folly

When a nickel will buy you a ride on the trolley.

—John H. Stedman.

### NO SPECIAL MOFFAT RATES FOR SATURDAY

On account of the shoving ahead of the Engineers' program and the transferring of the meetings from Friday to Thursday so that all may attend the official excursion over the Moffat Road on Friday, there will be no special excursion rates for Saturday, as originally planned and as previously announced. The regular rates will apply for that day. Those intending to "take in" this excursion on Friday, which promises to be one of the best features of the program of entertainment, should remember that it is very important to purchase tickets by Thursday noon in order that the arrangements can be made for trains and lunches. The fare for the round trip to Corona is \$3, including lunch.

Attention is called to the Far-Famed Georgetown Loop trip on Saturday and Sunday, Oct. 9 and 10. The trip over the Loop is one of Colorado's finest one-day trips. The round-trip rate on Saturday and Sunday is \$2.00. Trains leave the Union Depot at 8 and 8:10 a. m., returning in the evening at 5:35 and 5:45 p. m. Those who desire may extend their trip beyond to the summit of Mount McClellan, reaching an elevation of 14,007 ft., by paying an additional fare of \$2.00. Those who desire to "take in" Mt. McClellan should take the 8 a. m. train.

## ORGANIZATION FROM THE STANDPOINT OF THE SMALLER COMPANIES\*

By Ernest Gonzenbach, President and General Manager,  
Sheboygan Light, Power & Railway Company,  
Sheboygan, Wisconsin

Organization is frequently mentioned but not very often discussed. For one thing, it is a subject too vast for more than casual discussion in any one paper or at any one session. It is customary to cite as one of the advantages of consolidation, the fact that large companies can afford to maintain a better organization than is possible for smaller companies. It seems as if an undue amount of stress has been laid on this argument; it has weight and substance, to be sure, but is not paramount. We cannot dispute the fact that theoretically the larger the company, the better the organization, but it is quite possible for the small company to do almost as well as the larger companies, and this paper is written for the purpose of discussing ways and means.

A perfect organization employs specialists for each kind of work. Among railways, each department is in charge of a man who has specialized in that line and who sums up in his person the combined specialized knowledge of his subordinates. The specialist at the top must have a working knowledge of the specialties of those in his charge, for when he ceases to report to someone who knows about his specialty, he becomes a professional. The unit of any organization is the man who knows how to do something especially well, a little better or a little faster than the ordinary man. But even he is merely a link in the chain.

Organization is a method, the object of which is to impress the qualities of the man at the top on all of his followers. The leader must possess all of the qualifications which he wishes to impress upon his followers, and, in addition, he must win their absolute respect; if he possesses these two things, then confidence in him follows automatically. The leader himself may have qualifications not necessarily possessed by his followers, but always he must have a thorough knowledge of the strength and weaknesses, the degree of reliability and the loyalty of those who are to execute his commands. Perfect organization produces blind confidence in the leader, the proof of which comes only when the individual members are so welded together that no temptation in the way of greater rewards offered from other sources will tempt any one unit to sever himself from the others. It is not often that such perfection is reached in these days of commercialism, but is frequently found among the oldest organizations in the world, which are the ones founded on the profession of arms. All others are patterned after them. The same qualities and methods which enabled Caesar and Napoleon to produce results in their day will enable the modern industrial organizer to succeed. The most efficient organization to-day are those which are commanded by men who themselves have performed most of the tasks which are demanded of their subordinates.

A large railway company can afford to select its men so as to fit its organization, and the larger the company, the more specialists it can employ. There the work is split up into various divisions, and the divisions into sub-divisions, and it can be arranged that a man of such and such qualifications should fill a certain place. A large organization usually has the entire country as a recruiting field and it finds suitable specialists for all divisions sooner or later. By means of careful drilling, these independent units are fused by the flux of loyalty and respect into a comprehensive unit, ready to start and stop and to execute evolutions at the nod of the leader.

The small company is not in as strong a position, for its organization must fit the man, instead of the man fitting the organization. The field from which it must recruit its organization is necessarily more limited, and, operating as most of them do in small cities, they are handicapped by the unwillingness of the average man to separate himself more than a few miles from the sights and scenes of the flesh pots of Egypt. It was even so in the days when organizations were known only to the profession of arms, for the lovers of wine, women and song remained at home and waxed fat, while it was considered a test of manhood and loyalty to perform the actual work in the field. Recognizing the fact that the small company must necessarily draw its organization from a local and limited field, it requires more than the ordinary skill to hammer out of the crude mass a homogeneous unit which will efficiently respond to the peregrinations of the mind which moves it.

In the matter of college-trained men alone, the small company is at an enormous disadvantage. Not so long ago, college graduates in the street railway business were as scarce as brotherly love among Arctic explorers, but the climate is changing and the output of graduates has been so great that at the present time some organizations are so fortunate as to be able to employ college men in their section gangs. Unfortunately, the college graduate does not often stray very far afield, for what distinction is there in wearing a dapper Greek letter fraternity pin in some Jay town where the girls do not even know what it means? The executive of the small company must look to local productions and prodigies for his organization. These are the men whose boyhood homes were in the neighborhood or who have some other magnet which draws them to the smaller and more limited field. As a matter of fact, and contrary to the popular belief, the small company presents more opportunities for acquiring knowledge and getting a variety of experience in the shortest possible time than any other class of employment in the street railway field, and in making up an organization it is always wise to select men who have received their training in a small company. There is nothing more utterly hopeless and useless than the employment by a small company of some man who has had long experience in a larger concern, where he has specialized far beyond the needs of the small company. But for some mysterious reason, there is a class of small companies which seem to delight particularly in getting hold of a man who has received all of his training in a large company and therefore lacks the larger general knowledge required in the smaller field. The man who has been in charge of a one-horse power station where he had to do his own firing, oiling and engine-adjusting, is going to be a much better superintendent of motive power than the man who got his training piece-meal in a 15,000-hp plant. A man who has had charge of a few cars where he had to do his own wheel-changing, his own greasing, armature-winding, brake-adjusting, etc., is going to make a better master mechanic than the man drawn from the large shops, always of course, provided that he is the right man.

Incidentally, it may be mentioned that in no department of electric railway operation is there such an inviting field for men of ability as exists in the car-maintenance department. The country is fairly crying for competent men who understand car maintenance and the loudest and longest cries come from the companies where the master mechanic's insignia of rank consists of a pair of blue overalls and three streaks of grease on each side of his face. Many of the smaller companies would be willing to pay wages nearly as high as is paid to their general manager if they could only get the right man for that place. Now, if there is any part of the road where greater saving can be effected by judicious management, by careful attention to detail and knowledge of business, than in the maintenance of cars and equipment, we do not know where it is. Among the smaller companies we do not need wheel-specialists; we are not looking

\*Paper read before the American Street & Interurban Railway Association at Denver, Colo., Oct. 5.

for expert commutator-repairers nor for air-brake professors; we need men who have acquired general knowledge from actual contact with the work, supplemented by careful study. The presence of grease and mud deters some of our best men from specializing in this class of work. The dirt is there, but this impression of its omnipresence is wrong, resulting principally from the fact that the class of men whom we have, perforce, been obliged to employ for this work seem to have lost their perspective of the little niceties of life, for some would as soon butter their bread with axle grease as with jam and eat the whole with unwashed hands. The men who are earnest enough and capable enough to take up this class of work will look as clean before, during and after their work as any other class of mechanical service will permit.

Selecting men for the small road is the most important of all the duties of the executive head. Strict departmental divisions can be maintained and should be maintained, but must be in accordance with the qualifications of the departmental head. If one employs a superintendent whose qualifications limit him to the handling of men and schedules, then that should be his sole duty. If he is competent and capable of taking on additional duties, the organization should be flexible enough to permit such additional duties to be added with a commensurate increase in his compensation. It is always a good plan to employ a highly skilled mechanical man to take charge of equipment, by all means a college graduate, if such a man can be had. Fortunately, there is a continually increasing bear market in college graduates and it is now possible to pick up competent and certified ones in almost every hamlet. If the executive head of a company himself has acquired his position through the mechanical department, that department may be allowed a somewhat smaller amount on the general salary list than should be the case if the executive head is not himself a technical man. But the chief engineer is, by all odds, the most important man in the organization of the small company. This is amply evidenced by the fact that the younger heads of electric railways have mostly graduated to their executive positions through the mechanical department. Recognition of the limitations of personnel should include the recognition of his own short-comings by the executive. If he is inclined to be over-active or impetuous, his personal advisers and assistants should not possess the same faults, but can be so selected as to serve as a natural balance wheel to whatever short-comings it is desired to correct. Good organizations begin at the top and recognize that we are all human and prone to error and that the same faults we criticize in our subordinates may need correction in ourselves.

As to the total number of sub-divisions which may be permissible in a small railway organization, that is a matter depending entirely upon individuality and personnel of its members. It is safe to say that most small companies subdivide too much, rather than too little. If the executive head of the company has six or seven heads of departments reporting to him direct, he will not be as efficient as if he had only three or four heads reporting direct to him. The head of an electric railway has no business at any time with routine matters. The demands made upon his time from outside sources, political, financial and strategical, are too great and uncertain to warrant his being tied up to routine. When no political or financial clouds are on the horizon, the executive should be able to step out of his office on a minute's notice and be absent for several weeks without causing a ripple in the routine of affairs. If he cannot do this, he is not organized up to maximum efficiency.

As already stated, the departments can be more efficiently handled if there are not too many. In the small electric railway, the accounting department may with propriety and efficiency also include the purchasing department and claims. The superintendent may be in charge of transportation, employment and traffic and in many cases it is found

advisable to add the responsibilities of track-maintenance to his work, and there are many reasons in favor of this; one of the principal ones is that one man is responsible for the condition of the track over which the cars in his charge operate. Shops and power station are best combined under one head, even if not located under one roof. But no absolutely rigid lines can be drawn as the individuality of the employee is the determining factor.

The greatest payroll leaks existing among smaller companies are the result of departmental lack of organization. It is quite common to see two or three men getting good wages doing miscellaneous work around the shops from cleaning cars to winding armatures. More money can be made by organizing the little details and every-day routine than by any other method. The most efficient work is done by companies who make it a rule to have each task assigned to a certain man and to have that man do the same task day after day. If there are enough cars to keep one man busy cleaning, this man should under no circumstances be used for other purposes; if there are not enough cars to keep a man busy at this, then other daily duties should be added, but his task must be so apportioned that he can just perform it within the limits of his working hours, no more and no less. The "everybody busy" principle is the foundation rock on which paying organizations are built. One man under-employed is as dangerous an infection as a scabby sheep in the flock. High-priced mechanics chasing all over the shops for pieces of waste and tools are too expensive a luxury for the sort of roads which are obliged to squeeze pennies till the Indian lets out a war-whoop. One man assigned to one task, and keeping him everlastingly at it, is what makes low operating costs for small railways.

There are times when extraordinary help is required, but for such tasks, a floating gang is the solution and salvation of the small electric railway. This gang, as pointed out in a paper presented before last year's convention, consists of carefully selected men, "Jacks of all Trades," but trained to be the light cavalry of the campaign, who can instantly come to the aid of any division in distress.

An undue amount of stress is laid on the amount of wages which can be afforded. It is sometimes said that small companies cannot pay the wages which the larger companies do, but good organization will enable a reversal of these conditions. The small company really can afford to pay proportionally more than the larger company. Wages are the smallest part of a man's value. What one receives in return for wages is what counts. Unfortunately, in the street railway business we are still obliged to pay wages in return for time, and time is a poor asset. If we could devise ways and means whereby we pay for services rendered, it would be far better. Take the case of a man who has had training in a power station where he has gone through the various degrees of coal passer, fireman, oiler and shift engineer. He may be worth a hundred dollars a month in a large power station as shift engineer, but if his experience is supplemented by studious habits, alertness and decision, he may be worth a good deal more than that as chief in the power station of a smaller company.

The essential thing in organization is to make the individual units responsible for certain things, and to have each man responsible to one head from whom he receives praise or discipline as may be necessary. Probably more organizations have been disrupted from the violation of this basic principle than from any other cause, particularly among the smaller ones. In a company employing in the neighborhood of a hundred men, it seems to be rather a common occurrence to have the executive head give instructions to a foreman or employee, unintentionally ignoring the head of the department. The various units and the head of the company are in such close contact with each other that there is constant danger from this source, a danger which is as insidious as a malignant disease, and must be guarded against as studiously. There can be no organization unless the power

of discipline is centered in the one man to whom the employee reports. Neither can there be any organization if the power of employing his subordinates is taken away from any man. This is a cardinal principle sinned against all too often. The head of the company should select and recognize only the department heads and staff. The department heads will be required to select and appoint their foremen. The executive, under no circumstances, dictates to the department head as to whom he is to employ, but if the department head employs anyone who does not meet with the approval of the executive, then the offending one is removed, not by the executive but by the head of his department. Exactly the same rule is applied in the departmental organization. The head never dictates to the foreman as to the workingmen he shall employ. The foreman cannot be allowed as much discretion in the employment of men as the department head, but the foreman and the department head jointly select the employees and no employee is ever retained for a single moment if he is obnoxious to the foreman. If personal differences arise, the department head attempts to adjust them, but if they are beyond adjustment, somebody must step out, as no organization, large or small, can live if divided against itself. This plan would make unnecessary the employment bureau which has been found advantageous in some companies, but some one of the staff may keep a list of available employees, approximating the functions of the employment bureau. However, the principle of giving the immediate superior of the employee all the right of selection is never departed from. In the same way discipline and praise are bestowed. Never, for a single moment, is any employee allowed to believe that either he has an extraordinary high standing with his superior or that any superior may harbor any personal grievance against him. This principle precludes the employment of relatives of officers of the road. In a company where nepotism is practiced, no organization can be maintained. The near relation of any officer of the company, if he must be provided with a job, should be worked off on one's friends, rather than in one's own organization. There is no quicker or surer way of destroying the delicate balance of a well organized force of employees than to introduce our dear relations.

One of the essential points of good organization is that each and every incumbent of office is provided with an understudy. This is one of the important things which is often overlooked. Everyone knows of some company where the organization is dependent upon an individual, and should that individual suddenly be taken sick or be incapacitated from any cause, that organization requires weeks and months to reach again its normal state. Efficient organizations have been, and are, established on the one-man principle. There is one case within the knowledge of the writer when a railway of considerable size was built and operated on the one-man principle. The one man worked early and late. He had in the neighborhood of 18 different foremen reporting to him every day, and he laid out each day's work for every foreman. It worked all right so long as the man was available and on the job every day. When he was suddenly taken sick, however, the loss for weeks was stupendous and would have paid many times the salary of an understudy or of an efficient organization plan. The general manager who is afraid to provide himself with an understudy for fear that he may lose his iron grip on the salary list, is not worthy of the place. The understudy should preferably be one of the department heads. In a similar way the department head, with the general manager, may select a suitable understudy from among his foremen or staff. The foreman himself has an understudy among the rank and file. The system of understudies not only is an insurance against emergencies, but it serves beautifully to keep the hatbands of the men in all places from becoming too small for the owners' heads.

There is no line of study which an electric railway executive can pursue with greater profit to himself than the

study of military history, for nowhere has there been greater experience in organization, nor has it been carried to greater refinement anywhere. Political organization is not recommended as worthy of consideration because the aims and purposes of politics are personal advantage, regardless of cost to the whole. The aim of the military organization, on the other hand, is results, regardless of the individual. The military plan has established certain fixed rules which are essential and which are recommended for careful investigation by the student of industrial organization.

## ANNUAL MEETING OF MANUFACTURERS' ASSOCIATION

The annual meeting of the American Street & Interurban Railway Manufacturers' Association will be held in Auditorium Hall this afternoon at 5 o'clock. Every member should be represented, as five members of the executive committee are to be elected. The retiring members of the executive committee are Charles C. Peirce, W. M. McFarland, Henry C. Evans, A. H. Sisson and K. D. Hequembourg.

## HO FOR THE BARBECUE

The entertainment feature for this evening is decidedly Western in character and should prove a novelty to nearly all the visitors and a pleasant entertainment to every man and woman attending the convention. A wild-game barbecue is to be held at the "White City" beginning at 6:30 o'clock, and three elk, 25 bear and deer and 250 sage hens and grouse will be barbecued on the grounds. The exclusive use of the "White City" amusement park and all of its attractions has been secured through the courtesy of the Denver City Tramway Company, which has also generously provided the barbecue. A number of special cars will leave the Brown Palace at 6:00 o'clock, stopping at all other leading hotels en route. The ladies' "seeing the foothills" cars will also wind up at the "White City" in time for the barbecue. In addition, for the benefit of the people at the Auditorium, special cars will be waiting at convention headquarters until after the annual meeting of the Manufacturers' Association. These cars will take those in attendance directly to the "White City" to attend the barbecue. Delegates and visitors are requested to wear their official badges in plain sight. They will do well not to miss this feature, for a jolly good time is assured.

## COLORADO STATE CONVENTION

The seventh annual convention of the Colorado Electric Light, Power & Railway Association will be held Oct. 7, 8 and 9 at the Auditorium Hotel, corner of Fourteenth and Stout Streets. Delegates and guests of the American Street & Interurban Railway Association and allied associations have been invited to attend the general sessions, while the delegates and guests of the Colorado Association have been officially invited to attend the general sessions of the American Street & Interurban Railway and affiliated associations, and the exhibition and entertainment provided by the American Street & Interurban Railway Manufacturers' Association.

The active and associate members of the Colorado Electric Light, Power & Railway Association, who do not belong to one of the affiliated associations will receive official badges upon application to B. V. Swenson, secretary of the American Street & Interurban Railway Association.

The air brake equipments in the various exhibits are fine pieces of machinery and they have the additional merit that whenever they are put in operation everybody in the halls is aware of the fact by the soothing murmur which becomes evident to the delighted listener.

## REPORT OF THE COMMITTEE ON WAY MATTERS\*

By E. O. Ackerman, Chairman; J. H. Hanna, M. J. French,  
J. M. Larned, Martin Schreiber and G. L. Wilson

Your committee on way matters begs leave to report that, in accordance with the instructions of the executive committee, it has given its principal consideration to the subject of "The Use of T-Rails in Paved Streets," and herewith submits a report on that subject. It also submits a



Way Matters—Track in Utica, N. Y., Laid in 1908, with 100-lb. Open-Hearth T-Rail, Steel Ties, Concrete Foundation, Clark Joints

brief report on the subject of "The Use of Open Hearth and Manganese Steel Rails."

In regard to the very important question of economical maintenance, your committee has deemed it advisable to request that this subject be made the principal topic for consideration by the next committee as it is one of such serious importance that the time at our disposal does not permit a satisfactory treatment of the subject.

### The Use of T-Rail in Paved Streets

Your committee recommends the use of T-rail for track



Way Matters—One of the Most Congested Streets in Milwaukee with Pavement Eight Years Old.

construction in paved streets, except where the traffic is confined to the railway strip or is so congested that the strip is continually used by vehicles. Such conditions exist only in the largest cities, and here it is the opinion of the committee that a rail of girder section should be adopted, preferably sections following closely the lines of the two Trilby rails recommended by the committee on way matters

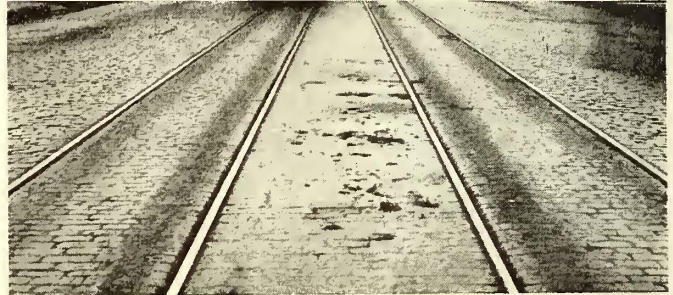
\*Abstract of report read before the American Street & Interurban Railway Engineering Association, at Denver, Colo., Oct. 4, 5, 6, 7 and 8, 1909.

of the American Street & Interurban Railway Engineering Association of 1907. In this section the rail is made concentric with the wheel loading, 7 in. and 9 in. in depth, and, at the same time, provided with a deep, roomy, self-cleaning groove that incidentally does not increase power consumption; besides it has a substantial, heavy, beveled head to suit the street paving and which allows a maximum wear.

This committee wishes to condemn the adoption and use of so many types of rails as are at present in vogue. Certainly the girder sections recommended satisfy the general requirements of modern practice and no improvements have been suggested up to this time that appeal to the committee as warranting a change in the proposed standard. It is recognized that unusual conditions occur which cannot be changed and which necessitate the use of types varying from the standard. Both types of girder rails mentioned have practically the same head or wearing part, but although the low rail, especially with the welded joint, has an advantage for stability, it is understood that it is not as desirable as a 9-in. rail where a mechanical joint is used.

Again, the particular type of paving in use should be carefully studied before specifying the height of rail. So it is not in the province of this committee to point out a definite rail section and height without knowing the particular conditions on the property in question; but it should not be a difficult matter to select a standard rail as long as the general principles recited above are taken into consideration.

Where the use of T-rail is recommended, if the type of pavement will permit, as with macadam, wood or other shallow block, a standard T-rail having a height and base equal, and weighing not less than 80 lb. per yard should be adopted. The committee recommends the use of the Ameri-



Way Matters—Minneapolis Street and Roadway Paved with Granite Laid in 1905

can Railway Engineering & Maintenance of Way Association standards, Section A and Section B, for such service.

For the heaviest service in connection with deep block pavement a T-rail 7 in. high with 6-in. base, 17/32-in. web and a head 2 3/4 in. by 1 3/8 in., weighing about 100 lb. per yard, is suggested. This is the section of rail recommended to the 1907 convention of the American Street & Interurban Railway Engineering Association, except that the depth of head has been increased to 1 3/8 in. to suit a deeper wheel flange and give longer life.

For light service with a deep pavement, the committee recommended a T-rail 7 in. high with a 6-in. base, a 7-16-in. web and a head 2 1/2 in. by 1 9-32 in., and weighing 80 lb. yd., which is identical with Lorain Steel Company section 335 and Pennsylvania Steel Company section 227.

### Recommendations

In conclusion, the committee on way matters recommends the adoption of the following:

(1.) For track construction where the type of pavement will permit, as in macadam or other shallow pavement, your committee recommends the adoption as standard; the T-rails weighing not less than 80 lb. per yard adopted as "recommended practice" by the American Railway Engineering & Maintenance of Way Association, April 22, 1908.

(2.) For track construction for the heaviest service in

connection with deep block pavements, your committee recommends the adoption as standard, a T-rail 7 in. high with a 6-in. base, 17/32-in. web and a head 2 3/4 in. by 1 11/16 in. and weighing about 100 lb. per yard, as shown in the drawing marked Fig. 1, section A. of the report.

(3.) For track construction for light service, in connection with deep block pavement, your committee recommends the adoption as standard of a T-rail 7 in. high with a 6-in. base, 7/16-in. web and a head 2 1/2 in. by 1 9/32 in. and weighing 80 lb. per yard, as shown in the drawing marked Fig. 2, section B, of this report. This section is identical with the Lorain Steel Company's section No. 335 and the Pennsylvania Steel Company's section No. 277.

(4.) For track construction for heavy service in connection with deep block pavement on streets where the traffic is confined to the railway strip, or is so congested that the railway strip is continually used by vehicles such conditions as exist only in cities of the largest class, your committee recommends the adoption, as recommended practice, the half-trilby girder sections shown on pages No. 122 and 123, Vol. 1, of the proceedings of this association for 1907, which sections were recommended by the sub-committee on rails and rail matters to the convention at Atlantic City in 1907.

(5.) In the matter of the use of open hearth and manganese steel rails and the increased width of gage on curves your committee wishes to report progress and recommends that the subjects be continued.

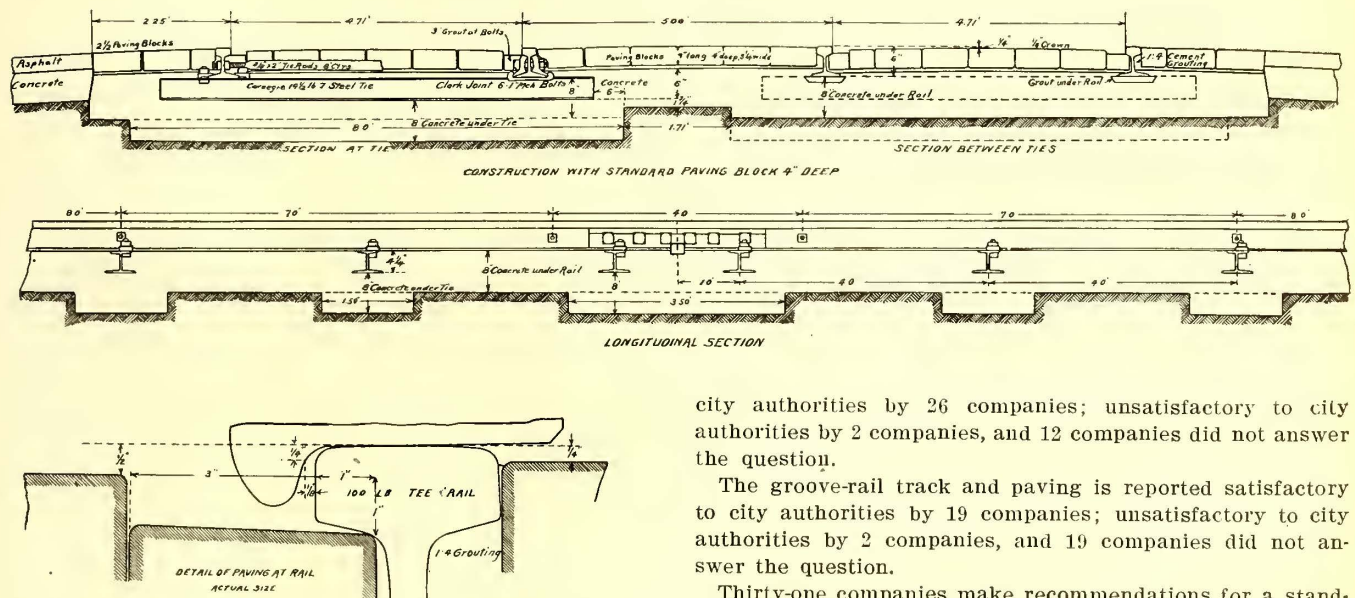
Type of Rail.	No. of Cos. Using.
Standard T-rail, 70 lb. to 100 lb. per yard.....	7
6-in. high T-rail.....	8
7-in. high T-rail.....	16
8-in. high T-rail.....	2
6-in. girder rail.....	1
7-in. girder rail.....	11
8-in. girder rail.....	1
9-in. girder rail.....	11

Practically all agree that heavily loaded vehicles can turn out of the flangeway along the rail now being used in modern track construction as easily or better than from rails formerly used; that vehicles are not damaged in crossing or turning out from said tracks, and that the rail now being used is considered by the city engineer or highway official to be as satisfactory for wagon traffic as any rail in service.

The T-rail track and paving is satisfactory to 30 companies; unsatisfactory to 2 companies, and 8 companies did not answer the question.

The groove-rail track and paving is satisfactory to 13 companies; unsatisfactory to 11 companies, and 16 companies did not answer the question.

The T-rail track and paving is reported satisfactory to



**Way Matters—T-Rail Track of the Utica & Mohawk Valley Railway Company**

[The committee collected and presented drawings and photographs of track in two cities where T-rail is used exclusively, and in one city where it is used extensively in paved streets. These drawings and photographs were furnished by George L. Wilson, engineer of maintenance of way, Twin City Rapid Transit Company; Fred G. Simmons, superintendent of construction and maintenance of way, The Milwaukee Electric Railway & Light Company, and M. J. French, engineer of maintenance of way, Utica & Mohawk Valley Railway Company. Parts are reproduced with this abstract.—Eds.]

**Rail for Track in Paved Streets**

Forty replies to Circular No. 11-a were received from as many companies, representing a total of:

- 4085 miles of track (on single track basis).
- 2180 miles of track in city streets, paved.
- 1174 miles of track in city streets, unpaved.
- 435 miles of T-rail track of modern construction in paved streets.
- 645 miles of groove and half-groove rail track of modern construction in paved streets.

The types of rail now being used in modern track construction in paved streets, as shown by the replies, are:

city authorities by 26 companies; unsatisfactory to city authorities by 2 companies, and 12 companies did not answer the question.

The groove-rail track and paving is reported satisfactory to city authorities by 19 companies; unsatisfactory to city authorities by 2 companies, and 19 companies did not answer the question.

Thirty-one companies make recommendations for a standard rail for use in paved streets, of which 13 companies favor 7-in. T-rail for all conditions.

- 6 companies favor Trilby or grooved rail, 7 in. or 9 in. high, for use where vehicular traffic is very heavy, and T-rail in outlying residence districts where vehicular traffic is light.
- 6 companies favor Trilby or grooved rail, 7 in. or 9 in. high, for all conditions.
- 6 companies favor standard or other sections of T-rail.

The height of rail considered as best practice is: 7 in. by 15 companies; 9 in. by 9 companies; scattering, 6 companies; and 10 companies did not answer.

Nineteen companies are required and 18 companies are not required to use the same kind of paving in the tracks as is used in the balance of the street. Three companies did not answer the question.

The type of paving considered as best practice is as follows:

First—For heavy vehicular traffic on both T-rail and groove-rail tracks:

Kind of Paving.	No. of Cos.
Granite block.....	11
Brick.....	11
Wood block.....	5
Miscellaneous and unanswered.....	13

Second—For light vehicular traffic on both T-rail and groove-rail tracks:

Kind of Paving.	No. of Cos.
Brick.....	15
Wood block.....	3
Granite block.....	3
Bitulithic.....	2
Miscellaneous and unanswered.....	17

The miscellaneous types include asphalt, macadam, concrete, Hassam block, slag brick and Belgian block

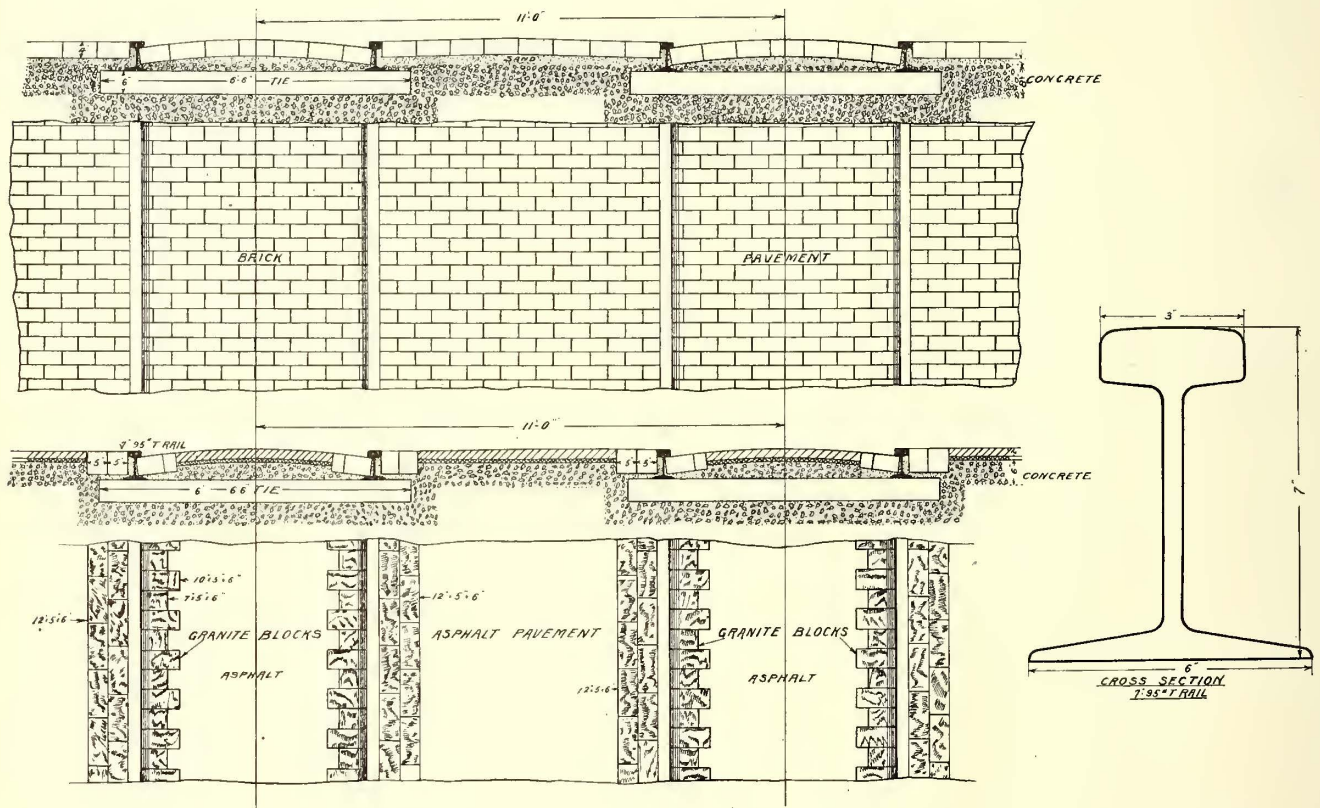
**The Use of Open Hearth and Manganese Steel Rails**

The committee has received reports from only 13 companies that have used manganese rails. This service has been of such short duration as to preclude any recommendations based on actual experience.

The use of open-hearth standard T-rail is quite prevalent and has been for some time, particularly abroad. In view of the fact that this subject has been very thoroughly investigated by steam railways, we have decided to recommend as standard specifications for open-hearth T-rail the specifications adopted by the American Society for Testing Materials, which are substantially those in use by the different

A summary of the replies to Data Sheet No. 11-b showed that of 33 companies replying, 20 companies had no open-hearth rail in use and 13 companies had a total of 113.8 miles in service. Of the 33 companies only 1 had any manganese rail in service, outside of specials. The report of this company is interesting and is given herewith in part: Miles of open-hearth rail? 5.1. Rail section? 85-lb., A S. C. E.

How does it wear in comparison with the Bessemer section? About three times as long.  
 Under what specifications was the rail obtained? Company's standard specifications.  
 Are you using any manganese rail outside of specials? Yes. What is the section? 85-lb.; both rolled and cast?  
 How long in use? Cast since 1902; rolled since November, 1908.  
 How does the life of the cast manganese compare with that of Bessemer or open-hearth? Cast manganese rails wore 54 times as long as Bessemer rail on curve, having center radius of 89 ft.  
 In what manner do you apply rail bonds to manganese steel rails? The bond terminals are compressed in holes punched in rails. Bond holes in rolled rails are



Way Matters—Track Construction in City Paving, The Milwaukee Electric Railway & Light Company

manufacturers. Specifications are made a part of this report.

The use of open-hearth steel for high T- and girder-rail has not been sufficient to warrant the recommendation at this time of standard specifications. We recommend, however, that the specifications for such rail now followed by the manufacturers be used until further developments warrant the preparation of standard specifications.

The use of manganese steel in special work is quite common, but its use in rails has so far been confined to locations where the conditions are unusually severe. The only specifications for manganese steel rail that we have been able to obtain are those of the Manganese Steel Rail Company. Other manufacturers of manganese steel rail state that they have no specifications that they are willing to publish; and we consider that, while the use of this type of rail has given in some instances very satisfactory results, it is still in its infancy, and the adoption of any standard form of specification must await future developments.

punched and drifted to size by the manufacturer. Those in cast rails are made by casting a piece of iron pipe in the rail, and reaming the hole to size.

**Manufacturers' Specifications for Manganese Steel Rails.—  
Manganese Steel Rail Company**

- (1.) Chemical Composition.— Percentage.  
 Carbon..... 0.90 to 1.20  
 Phosphorus.....Not over 0.10  
 Silicon.....Not over 0.50  
 Manganese..... 9.50 to 16.00  
 Sulphur.....Not over 0.06

(2.) Section.—Unless otherwise specified, the section of rail shall be the American Standard, recommended by the American Society of Civil Engineers, and shall conform, as accurately as possible, to the templet furnished by the railroad company, consistent with clause No. 3, relative to specified weight. An allowance in height of 1/16 in. under, and 1/32 in. over will be permitted. A perfect fit of the splice bars, however, shall be maintained at all times.

(3.) Weight.—The weight of the rails shall be maintained as nearly as possible, after complying with clause



No. 2, to that specified in contract. Rails shall be accepted and settled for according to actual weights.

(4.) Length.—The standard length of rails shall be 30 or 33 ft. Ten per cent of the entire order will be accepted in shorter lengths, varying by even feet down to 24 ft. A variation of 1/4 in. in length from the length specified will be allowed.

(5.) Branding.—The name of the maker and the year of manufacture shall be rolled in raised letters on the side of the web, and the number of the heat shall be stamped on each rail.

(6.) Drilling.—Circular holes for splice bars shall be punched or drilled in accordance with specifications of purchaser. They shall be accurate in every respect to drawing and dimensions furnished, and free from burrs.

(7.) Finishing.—Rails to be straightened while cold, to be smooth on head, to be sawed square at ends, and, prior to shipment, to have the burr occasioned by saw cutting removed, and to have the ends made clean. They are to be free from injurious defects.

(8.) Inspection.—The inspector, representing the purchaser, shall have free access to the works of the manufacturer at all times while his contract is being executed, and shall have all reasonable facilities afforded to satisfy himself that the rails are being made in accordance with specifications.

The manufacturer shall furnish the inspector, daily, with

tabulated flange-path data for cars on curves under varying conditions, presented by Charles Alden, chief engineer railway department, Pennsylvania Steel Company. [Mr. Filkins' paper will be found elsewhere.—Eds.]

The committee believes that in T-rail work it is best to place the T-guard rail 1/2 in. to 5/8 in. higher than the running rail, as compared with 3/8 in. for the rolled guard. This increase in height is necessary on account of the beveled edge or rounded corner of the T-rail.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

Many members of the associations who are also members of the American Institute of Electrical Engineers will be interested in the knowledge that R. W. Pope of New York,

Wheel diam. 33"

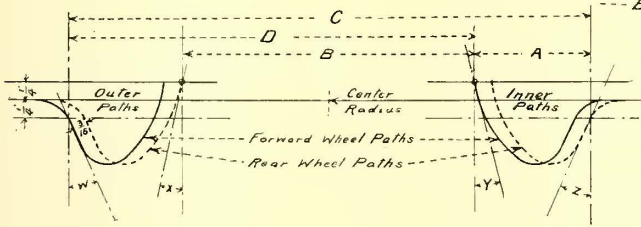
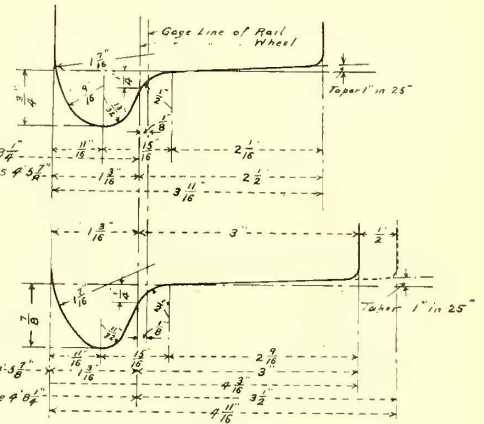


Table with 4 main columns for wheel bases: 4'6" WHEEL BASE, 6'0" WHEEL BASE, 7'6" WHEEL BASE, and 9'0" WHEEL BASE. Each column has a 'Center Radius of Curve' row and a grid of numerical values for dimensions A through Z. Below the table are labels for drawing numbers: 51522, 51512, 51532, and 51542.

Way Matters—Tabulated Flange Path Data, Prepared by Pennsylvania Steel Company

carbon determinations of each heat, and a complete chemical analysis every 24 hours, representing the average of the other elements contained in the steel.

Width of the Gage in Curves

Circulars were sent out to member companies in reference to best practice and recommendation for gage of curves. Thirty-two replies were received, which show a considerable variation in the practice of increasing the width of gage. However, in the majority of reports the general practice is shown to be that of increasing the gage for curves varying from 100 to 35 ft., center radius, from neat gage to plus 3/8 in.

On account of many companies being burdened with cars of different types and it not being practicable to change the size of the throat of guard rails for varying radii, it follows that the extreme conditions must be taken care of, which probably accounts for the greater number of reports showing an increase of gage on curves.

The committee is very glad to append to the report a discussion of this subject with accompanying diagrams by C. W. L. Filkins, M. C. E., with William Wharton, Jr., & Company, Inc., Philadelphia, Pa., furnished through the courtesy of V. Angerer, vice president and general manager; also a drawing of the Pennsylvania Steel Company, giving the

secretary of the Institute, is attending the convention. Mr. Pope has been "swinging around the circle" in the interests of his society. He left New York Aug. 18 and has been to Seattle, Portland, San Francisco, Los Angeles and Salt Lake. At all these cities he has addressed members of the Institute and has greatly quickened the interest in the affairs of the organization. He has been cordially welcomed everywhere by electrical men and is gratified at the success of his trip. He was the guest of Prof. H. J. Ryan at Stanford University, where he gave a talk to the students of the engineering courses, Sept. 17. He also visited Visalia and California Hot Springs. In Denver his headquarters are at the Hotel Staudish, where he will remain until Friday. During his stay there will be a luncheon for Institute members, probably on Thursday, the arrangements for which are being made by W. E. Goldsborough. On Oct. 9 Mr. Pope will address the St. Louis section of the Institute in that city.

The Manitou & Pike's Peak Railway was completed on Oct. 20, 1890. The project was first conceived in 1884 and the first grading commenced in 1889. Its exact length is 47,992 ft.

### RAIL GROOVES AND TRACK GAGE FOR CURVED TRACKS\*

By C. W. L. Filkins, M. C. E.

The primary principle of wheel contact on curves is that the forward inside wheel of a car truck shall bear against the inside guard and the rear outside wheel against the outside guard, thus keeping the flanges of all of the wheels clear of either rail head and eliminating the side-wear on the heads. In practice this is impossible, due to irregularities, and could not be maintained, due to the wearing of the guards. The ideal conditions would be new wheel flanges and a particular rail for every curve, wheel-base and flange, but this is prohibitive, both for the traction company and the manufacturer, owing to inaccuracies in wheel setting, different flanges and wheel-bases over the same track, and most particularly to the necessarily limited number of types of rolled guard rail sections.

#### Determination of Minimum Groove

Having a fixed rail groove as above intimated, it is desired to know if that groove will properly serve under the given conditions, and if not, how to alter it to meet them. Without discussing the question of wear on wheels or rails, as

line outline curve FCH, tangent to all of these projections, is the contour of the required minimum groove.

The gage-line of a grooved rail or of a groove is customarily taken as the intersection of a horizontal plane through the tread-line with the head side of the groove produced, the rounded corner being ignored. Accepting this in what follows, we inquire the position of such a gage-line for the minimum groove as compared with a gage-line as determined by the standard gage. If in Fig. 1 with the mid-point O of the axle as center, we describe the circle D-E, of diameter equal to standard gage and draw track arcs tangent to D-E, one on each side, and produce then to A-B (Fig. 2), we determine the position of the standard gage-line. Only one such determination—at m-n—is shown in Fig. 2. For wheels set to a gage  $\frac{1}{4}$  in. less than standard gage and with the wheel gage-line taken at a point on the fillet of the flange  $\frac{1}{4}$  in. below the level of the tread, it is found that the standard gage-line and the minimum groove gage-line coincide for all flanges used at the present time. This also holds for M. C. B. flanges set to M. C. B. Association standard (M. C. B. Association Report of 1907). There may be a slight exception to the above conclusion in the case of American Street & Interurban Railway Engineering Association flanges A and B, for which the groove gage-

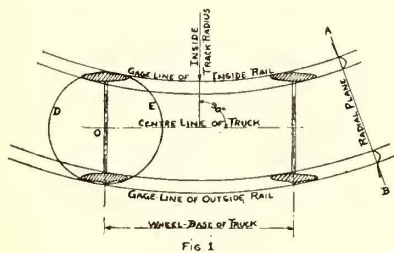


FIG 1

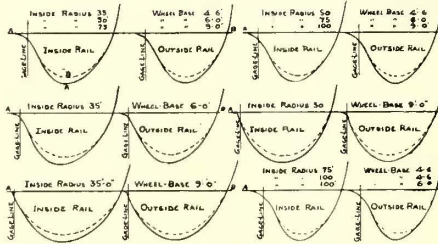


FIG 3 SECTIONS OF MINIMUM GROOVES FOR AS&IR ASSOCIATION FLANGES A AND B

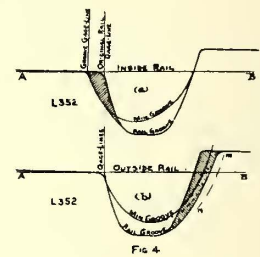


FIG 4

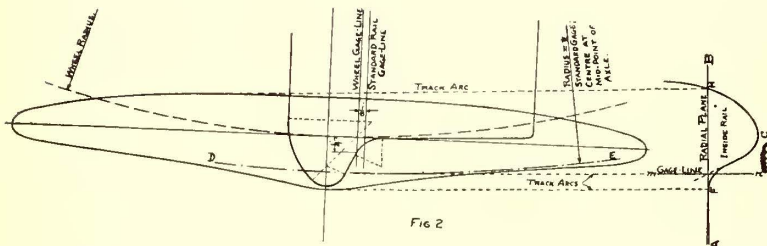


FIG 2

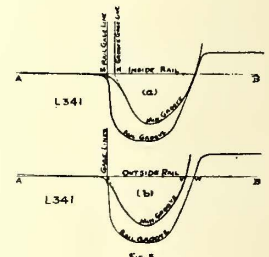


FIG 5

#### Rail Grooves and Track Gage for Curved Track—Figs. 1, 2, 3, 4, and 5

others have somewhat thoroughly considered that in the forms of wheel flange and rail groove, let us find the minimum groove in which a given wheel flange will run, on the assumption that the equipment is geometrically perfect. In a car traversing a curve, the longitudinal axis of the car truck is normal to the radius of curvature of the track drawn to the mid-point of the truck, the wheels being held rigidly parallel to the axis. The portions of the wheel flanges which determine the size and shape of the minimum groove are the portions below the shaded sections shown in Fig. 1. The shaded areas are sections of the wheels on a level with the wheel-tread. If we project these portions of the flanges upon a radial plane, we obtain the contours of the minimum grooves, as shown at AB. To obtain these projections (see ABC, Fig. 2), pass a series of planes perpendicular to the axis of the truck. They will cut lines from the surface of the flange. Project these lines by means of track arcs upon the radial plane AB (shown rotated about line AB, as an axis, into the plane of the paper).

line appears to fall outside the standard gage-line  $\frac{1}{32}$  in. for large wheel-bases and very short track radii. As other conditions will cover this item, we will ignore it in what follows.

By the method set forth above, the following set of minimum grooves has been obtained for the American Street & Interurban Railway Engineering Association flanges known as A & B (See Fig. 3).

The dotted lines refer to flange B, the gage-line shown on these contours indicates the position of the standard gage-line, as explained above. In a similar manner, the minimum grooves for other flanges have been plotted, and the data so obtained used in Fig. 6, as will be explained later.

In what follows we premise that, owing to the uniformity of the wheel flange section, the practical inside groove required under given conditions is the same as the minimum groove for the same conditions; also that the inside guard guides the truck around the curve.

For equipment at the present time it seems reasonable to limit the range of irregularities in wheel setting to  $\frac{1}{4}$

\*Paper presented as a part of the report of the Committee on Way Matters.

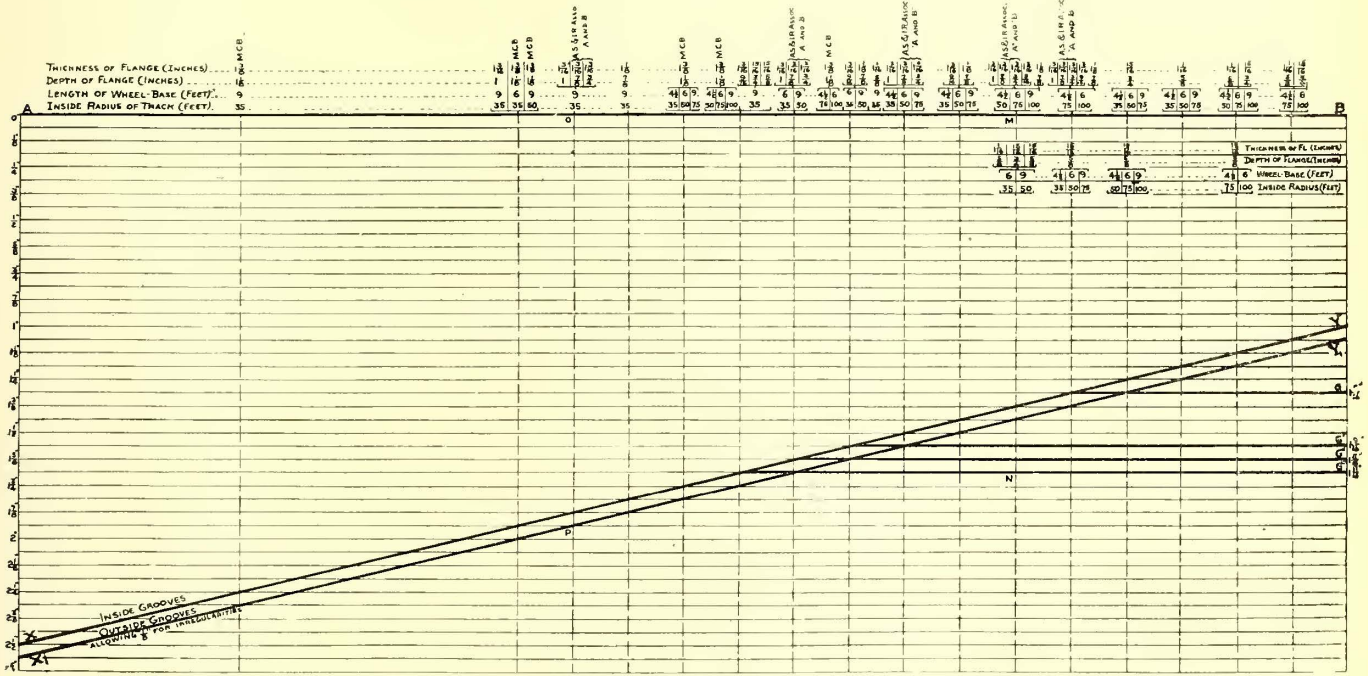
or 1/8 in. to each wheel, distributed 1/16 in. on each side of the normal position of the wheel. Since this variation may occur simultaneously to double the effect, there is an 1/8-in. change outward and inward from the normal position of the outside wheel flange. The outward movement will seldom require attention, as it will probably be taken up by the fillet and riding on the head of the outside rail, and practice indicates that irregularities in that direction are rare. The inward movement of 1/8 in. must be provided for by holding the outside guard back, thus increasing the width of the outside minimum groove that amount for practical purposes.

Let us now adapt the minimum grooves of Fig. 3 to the following case: American Street & Interurban Railway Engineering Association flange A, Lorain Steel Company rail

tween the guard and the gage side of the groove measured on a level with the tread, the rounded corner due to fillet or head being ignored. By plotting the widths of the minimum grooves as abscissae and the wheel-bases as co-ordinates, it is found that for a given flange the width of the groove varies directly as the wheel-base and inversely as a function of the track radius. Without insisting upon an accuracy closer than 1/32 in., the following simple formula for the width W (in inches) of the minimum grooves for the American Street & Interurban Railway Engineering Association flanges A and B was obtained:

$$W = \frac{1}{16} \left( \frac{45 B}{R} + 18 \right),$$

where B = length of wheel-base in feet and R = radius of



The vertical distances between base-line AB and line XY represent the width of inside groove, measured on the level of the tread line of the rail, to pass the wheel flanges, in combination with the wheel-bases, on curves of the radii, all as given at the base-line AB. The vertical distance between line AB and line X<sub>1</sub>Y<sub>1</sub> represent the width of the groove of the outside rail which should be used in conjunction with that given for the inside rail, to allow for variations in wheel setting. For wheels set to a gage 1/4 in. less than the standard track gage and with the wheel gage-line taken at a point on the fillet of the flange 1/2 in. below the level of the tread line, curves with grooves as in diagram should be laid to standard track gage.

Rail Grooves and Track Gage for Curved Track—Fig. 6— Width of Rail Grooves on Curves Under Varying Conditions

section No. 341, inside track radius of 50 ft., and wheel-base 4 ft. 6 in. Place the guard of L-341 tangent to the inside minimum groove contour for the given conditions—see Fig. 5 (a). The minimum groove lies wholly within the rail groove, and the rail gage-line fails to coincide with the standard gage-line by the amount M-N. Evidently the standard gage should be widened the amount M-N, and there is no planing of the rail section for the inside rail. Fit the head of the rail section into the outside minimum groove contour—Fig. 5 (b). The rail and standard gage-line coincide, and hence there is no widening of the gage due to this last operation. If V-W be not less than 1/8 in., the outside groove will be sufficiently wide to take care of irregularities. In general, if the width of the given rail groove exceeds that of the inside minimum groove, widen the standard gage the amount of the excess, the wheels being set as explained above. A further widening of the gage will but decrease V-W, and ultimately the wheels will bind between the guards, unless the outside groove were planed to greater width. By width of groove is meant the horizontal distance be-

Horizontal line G, G', G'' and G''' represent the width of grooves in commercial girder guard rails now rolled. Where the width of groove necessary for the combination of wheel flanges, wheel-bases and radii, as given by the diagram, is smaller than the width of groove in the girder guard rail to be used, the gage of the track on the curve should be widened by an amount equal to the vertical intercept between the line XY and the line G, G', G'' and G''' respectively. Where the width of the required grooves are greater than the width of the rail groove, the amount of planing is indicated by the intercept between XY and X<sub>1</sub>Y<sub>1</sub> and the lines G, G', G'' and G''' respectively.

the curved rail in feet. Similarly for M. C. B. flange:

$$W = \frac{1}{16} \left( \frac{8,000 (B - 2)}{R^2 + 100 R} + 24 \right)$$

Six other flanges, whose groove widths have been used in Fig. 6, were determined in a similar manner, the formulae being similar in form to the first one given above. The formula for the American Street & Interurban Railway Engineering Association flanges does not give grooves wide enough by 1/16 in. or less for radii much in excess of 100 ft., but above 100 ft. the minimum groove differs inappreciably from the form and size of the flange section.

By means of the grooves which have been plotted, we are enabled to note the effects of variations in the given data as follows:

- (a) The width of the groove increases directly with and in the same amount as the width of the wheel flange.
- (b) Increasing the depth of the wheel flange slowly increases the width of the groove, depending greatly upon the form of the flange in obtaining the increased depth.

(c) The effect of wheel radius upon the grooves is negligible for the present range of wheel radii.

(d) The effect upon the grooves of different track gages from 4 ft. 8½ in. to 5 ft. 4½ in. is inappreciable.

(e) The factors, outside of the wheel flange, which critically affect the grooves, are the length of the wheel-base and the track radius.

(f) For track radii greater than 100 ft., the minimum groove is practically the same as the flange section.

(g) The effect of the gage is to make the width of the outside minimum grooves about 1/16 in. less than for the inside; hence the practical outside groove, allowing 1/8 in. for play, should be 1/16 in. greater in width than the inside minimum groove.

Using the inside minimum grooves as a basis (Fig. 6), draw a convenient oblique line X-Y as referred to a fixed base-line A-B. By means of the vertical scale, find points on X-Y at distances below A-B equal to the widths of these inside minimum grooves and draw the verticals to A-B, designating them as there shown. Results for a 7.5-ft. wheel-base have not been tabulated, but values for this wheel-base may be read off from Fig. 6 by direct interpolation. Thus, for a flange 1½ in. thick, 7/8 in. deep and a 50-ft. inside track radius, the width of groove is 1 9/16 in. for a 9-ft. wheel-base and 1 7/16 in. for a 6-ft. wheel-base; hence 1½ in. is the width of groove for a 7.5-ft. wheel-base, as would be given by the mean vertical.

Note.—The thickness of flange as used on this diagram (Fig. 6) is measured on a level with the wheel tread and is the distance from the guard side of the flange to the wheel gage-line, the latter being 1/8 in. inside of the standard track gage-line and at a point on the fillet 1/4 in. below the wheel tread. The depth of flange is its extreme depth below the level of the wheel tread.

Since the width of the practical outside groove must be 1/16 in. wider than that of the inside minimum groove, in Fig. 6 draw X<sub>1</sub>-Y<sub>1</sub> 1/16 in. below X-Y. The vertical lines between X-Y and A-B give the necessary widths of inside grooves for the given conditions, as indicated at A-B, and similarly the necessary widths of the outside grooves, 1/8 in. being allowed for irregularities, are given between X<sub>1</sub>-Y<sub>1</sub> and A-B.

Theoretically the rail grooves should have the widths thus obtained, but we are limited by the commercial product in rolled sections, the widths of grooves of which are 1 5/16 in., 1 9/16 in., 1 5/8 in., and 1 11/16 in., and a few specials. The widths of these grooves are shown in Fig. 6 by the horizontal lines G, G', G'', and G'''. The effect of using some standard rail under given conditions is now easily seen. For example, for American Street & Interurban Railway Engineering Association flange A, wheel-base 9 ft., inside radius 100 ft. and a 1 9/16-in. grooved rail; on line M-N of Fig. 6, we read the required width of inside groove = 1 3/8 in. and of the outside groove = 1 7/16 in. Evidently the 1 9/16-in. groove of the given rail is 3/16 in. wider than the required inside groove and 1/8 in. wider than the required outside groove, as easily seen by the intercepts on M-N between G' and X-Y or X<sub>1</sub>-Y<sub>1</sub> respectively. Hence the gage must be widened 3/16 in., the intercept on M-N between X-Y and G'. We also note that there is a clearance of 1/8 in., the intercept on M-N between X<sub>1</sub>-Y<sub>1</sub> and G', between the outside flange and the outside guard over and above the allowance for irregularities. It might be well in this case to widen the gage an additional 1/8 in. and thus make greater allowance for irregularities and obtain earlier bearing against the inside guard.

With the same flange, wheel-base and same rail, let us try a 35-ft. radius. It is seen that the rail groove is 5/16 in. narrower than is required by the inside flange and 3/8 in. too narrow for the outside flange. The head of the inside rail must be planed 5/16 in. and the outside guard 3/8 in. The locations of these planings are so taken as to least affect the wearing portions of the rails, as shown in Fig. 4. Since planing a rail places it in a type with a wider

groove, it must be placed in the wider groove class in examining for change from the standard track gage. The inside rail groove is now 1 7/8 in. wide. The intercept on O-P between X-Y and a horizontal line corresponding to a 1 7/8-in. groove is zero; hence there will be no widening of gage.

For the determination of the exact amount and contour of planing, place the guard of L-352 tangent to the inside minimum groove contour for the given conditions. See Fig. 4 (a). The shaded portion shows the amount of planing necessary to adapt this rail to the conditions. On planing this rail evidently its new gage-line will coincide with the standard and the minimum groove gage-lines, since the latter practically coincide, thus again showing that there will be no change in the standard gage due to this operation.

Now fit the head of the rail section into the lines of the outside minimum groove for the given conditions. It is seen that the rail gage-line and the standard gage-line coincide; hence there will be no widening of the gage for these particular conditions, provided we do not allow for any irregularity in the setting of the wheels which would tend to increase the normal gage distance. That such irregularity tends to decrease rather than increase the normal gage distance of the wheels is a practical fact.

From Fig. 4 (b) we see that planing of the guard is necessary, but due to irregularities in wheel setting, the total amount of planing is not immediately shown. Allowing for this 1/8 in. in Fig. 4 (b), as shown by the dotted line, and drawing the fine full line to give a reasonable groove contour, the shaded area shows the amount of planing of the outer rail for practical conditions. To reduce the amount of planing from either rail, a slight shifting of the section along A-B, requiring a slight planing of the guard in Fig. 4 (a) or of the head in 4 (b), may sometimes be advisable. By increasing the amount of planing of the outside guard by 1/8 in. and widening the gage 1/8 in., allowance may be made for an outward movement of the outside flange for irregularities, and an earlier bearing against the inside guard also obtained.

For uniform practice it is suggested that in the case of a widened gage the gage-line of the inside rail be made to conform to the geometrical position of the standard gage-line and the outside rail moved outward the amount the gage is to be widened. Geometrical purposes would thus require that the gage narrow abruptly at the points of tangency, even though not carried out in practice. Some of the usual methods of eliminating this widening in the neighborhood of tangents is to narrow the gage of the curve as it approaches the tangent; another is to carry the widened gage through onto the tangent and there gradually narrow down to the standard. As a matter of fact, the gage of the curved track contiguous to the tangent and the gage of the tangent should have an increased widening, as compared with the more central portion of the curve, as the straight track acts as a curve of increased radius in conjunction with the curve. This additional widening could be accomplished very effectively by giving a slight curve to an extension of the inside rail into the straight track, commonly called the straight guard on the end of curves.

#### Conclusions

In conclusion, we might summarize as follows: For the flanges in use at the present time and provided the wheels are set 1/4 in. less than standard gage at a point 1/4 in. below the level of the wheel tread; also allowing 1/8 in. for tightening of wheel gage due to irregularities in wheel setting.

(a) There will be no widening of the standard track gage when the width of the rail groove does not exceed that of the required inside grooves;

(b) If the width of the rail groove exceeds that of the required inside groove, widen the gage the amount of excess;

(c) If the rail groove be too narrow, plane the inside head to give the width required for inside groove and the outside guard to give a width 1/16 in. greater than that of the planed inside groove;

(d) If the rail groove be of correct width for the inside groove, do not widen the gage, but plane the outside guard to increase the width of rail groove by 1/16 in.;

(e) For the range of radio in common use (not less than 25 ft.), there will be no narrowing of standard gage.

(f) For a given rail, the widening of gage is greater the longer the track radius;

(g) When the outside rail is not guarded, the statements as to widened gage still hold, but obviously the planing of the outside guard need no longer be considered.

Practice will call for some modifications in the application of these theoretical conclusions, as it is obviously impracticable to change the gage for every radius of curve in a layout. The tendency of the practice, therefore, should go towards selecting a rail with a groove nearest suitable to the combination of conditions, or plane the groove to suit where necessary, and lay the curve to the standard gage.

Where cars of different wheel-bases and wheel flanges traverse the same curves, the combination calling for the widest groove must govern the groove and the combination calling for the narrowed groove then applied to the wide groove must govern the gage, with extra allowance in the width of the outside groove equal to the widening of the gage.

## COMMUNICATIONS—SHARP FLANGES

Denver, Colo., Oct. 5, 1909.

To the Editors:

The writer suggests the following as a possible remedy for the sharp flange trouble with steel wheels:

The design of motor trucks has now been improved to the point where there is not much probability of their getting out of square, and roller center and side bearings remove any other cause for this trouble.

In the experience of the writer whenever one of a pair of wheels begins to show wear on the flange this wheel is invariably a trifle smaller in diameter than its mate, so that the cause for wear on this flange then is the large wheel running ahead on a straight track and thus crowding the flange of its mate against the rail. It is very evident that the remedy is to grind the large wheel to the same size or a very trifle smaller than the one with the sharp flange, which will remove the cause, or will reverse the grinding action, and permit the wheel with the sharp flange to build out slightly as the tread wears down.

The grinding could be done possibly by using an emery filled shoe. The emery filled shoe must be applied before the sharpening of the flange has progressed very far, or when this wheel is but a trifle smaller than its mate. When the flange has become so much worn that it would be necessary to turn down the wheels there will be a difference in diameter of the wheels of from 1/4 in. to 3/8 in., which is too much difference to be removed by grinding.

W. G. PRICE,

Engineer, Standard Motor Truck Co.,  
Pittsburg, Pa.

Clarence A. Ross, president of the Engineering Construction & Securities Company of Chicago, is attending the convention. Mr. Ross brings the cheering news that construction work is proceeding vigorously. His company is about to build a 10-mile interurban extension from Albia to Buxton, Ia., and also another of 33 miles from Clarinda, Ia., to Tarkio, Mo. In addition the firm of Rattenborg, Ross & Judd of Atlantic, Ia., of which Mr. Ross is a member, is about to build a 58-mile extension of the Atlantic, Northern & Southern, connecting Villisca and Manning, Ia. This will be a steam road.

## A NOCTURNE

Many railway and supply men give serious consideration these days to the question whether it is better to stay up all night or to try to get some sleep. To all such the little poem on "The Lark and the Owl," written by John H. Stedman, the poet laureate of the association, some time ago, and published in *Life*, will be read with thoughtful attention. Here it is:

The blithesome lark on joyous wing  
Rises to seek the light;  
The owl, though, does a better thing  
In sitting up all night.

Weary with early-rising cares  
The lark rests with the sun;  
The owl the joys of darkness shares—  
His lark has just begun.

Let the bird that flies at daylight  
Kite and carol as it may;  
The bird that's bumming 'round at night  
Is the wisest, all men say.

Tennessee has its quota of delegates to the convention, and one of them, who is also well-known among electrical men in other parts of the country, is W. E. Boileau, general manager of the Chattanooga Railway & Light Company.

George W. Knox of the Knox Engineering Company, Chicago, is wandering about, dispensing happy smiles hither and yon. One reason appears to be that he has been retained to do the engineering for the new power house of the Rock Island Southern Railroad.

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, and the one to whom the honor has been given of having promoted, built and operated the first interurban railway in the state of Indiana, is with us. Mr. Henry was prominent in the organization of the Central Electric Railway Association and is a past president of that aggressive body of railway officials, which controls the destinies of the electric railway properties in Indiana and Ohio.

W. T. Van Dorn of the W. T. Van Dorn Company, Chicago, is not only a pioneer in the manufacture of drawbars but he has the further distinction of being a pioneer of Denver. Mr. Van Dorn first came to this city in July, 1864, after making the journey from Quincy, Ill., by ox team and caravan. Mr. Van Dorn had some interesting experiences during the two and a half months which was required to make the trip from the Missouri river to Denver, as the Indians were very hostile.

Frederick W. Darlington, electrical engineer of the Denver & Interurban Railroad, the single-phase line connecting Denver and Boulder, was one of the pioneers in heavy electric traction. In the early nineties, Mr. Darlington installed for the Pennsylvania Railroad the electrical equipment on its Burlington & Mt. Holly branch. This was the first branch of the Pennsylvania Railroad to be equipped with electricity and was the first steam railroad to be electrically equipped. Later, Mr. Darlington was chief engineer of the Philadelphia Traction Company, one of the constituents of the present Philadelphia Rapid Transit Company, and had a large part to do with the design and construction of the company's electric power stations at Thirteenth Street and Mt. Vernon Street and the one at Thirty-third Street and Market Street. Mr. Darlington was also a pioneer in the design and construction of electric fountains and installed a number of the largest electric fountains in the country. His work in connection with the Denver & Interurban 11,000-volt equipment has attracted wide attention among engineers.

## Among the Exhibits

Paul Stewart of the John A. Stewart Electric Company, dealers in electrical and steam machinery, Cincinnati, Ohio, is on hand with a special list of large power apparatus. His headquarters are at the Brown Palace Hotel and in the Electric Railway Equipment Company's exhibit space.

\* \* \*

The Whitmore Manufacturing Company, Cleveland, Ohio, is distributing as a souvenir a unique metal bookmark and paper cutter. The handle is in the shape of a gear whose life has been preserved intact by Whitmore's gear protective composition.

\* \* \*

At the booth of the Archbold-Brady Company, Syracuse, N. Y., may be seen photographs and blue prints of catenary bridge construction and towers for transmission lines and high-tension crossings over rivers and railroads. Some large photographs of catenary bridges, of which this company makes a specialty, are particularly interesting.

\* \* \*

Albert & J. M. Anderson Company, Boston, Mass. are showing 66,000 volt disconnecting switches of a truss type; a full line of switches and "Boston nuggets" in the shape of pure copper castings; a remote control mechanism for oil switches; and time switches for a.c. circuits up to 3000 volts. The company is represented by Alfred E. Andersen of Boston and Ernst and Henry Woltmann of New York

\* \* \*

The Eclipse Railway Supply Company, Cleveland, Ohio, is showing at Booth No. 601 in the Annex, its new model "Acme" type of "Eclipse" fender, designed for double-end equipment or where trailers are used. With this design it is not necessary to remove the fender when coupling at either end of the car. The company is also showing microscope pictures of the life guard picking up a man while the car is running at high speed. The exhibit is in charge of Ross Forward.

\* \* \*

The O. M. Edwards Company, Syracuse, N. Y., Space No. 384 in the Auditorium exhibit, has a complete line of car window and trap door fixtures. It is the aim of this company to have window fixtures to meet all kinds of car construction, either steel or wood. Fourteen designs of window fixtures arranged for single, double, drop or semi-convertible sash are shown. All fixtures exhibited are designed and manufactured exclusively by this company. The steel trap-doors in three designs shown for interurban cars have already come into universal use on cars of this type, replacing the ordinary wooden door used for this purpose.

\* \* \*

The pressing question of fare collection has brought forward one of the most interesting exhibits at the convention in the form of the TEC registering fare box. This is the box recently adopted by the Metropolitan Street Railway of New York City after a year's test of all types of fare boxes that have come on the market. The TEC box collects dimes, nickels and cents, registers them on a dial reading in money and then returns them to the conductor for change. The two important features of this box are: first, it collects and registers all coins of the right denomination, no matter how mutilated or disfigured; second, the conductor has absolutely no control over the destination of the coin. He cannot by-pass coins to a box to which an inspector has access. Collusion is thus impossible. It is claimed for the TEC box that it has no tubes or slots through which the coin must pass; that it is absolutely free of delicate mechanism; that it has nothing to get out of order, and that during the months of the severe tests on the New York City lines

it never made a mistake of a single cent. The exhibit is in charge of Robert C. Adams of the Transportation Equipment Company, New York.

\* \* \*

Large crowds have been attracted to the extensive exhibit of the Pennsylvania Steel Company and Maryland Steel Company in the Annex. The Pennsylvania Steel Company is the oldest company of its kind in the United States. It was organized in 1865 and made the steel from which were rolled the first steel rails produced commercially. Its plant is on a tract of land which has been gradually extended until it now covers a distance of three miles along the bank of the Susquehanna River below Harrisburg, Pa.

The Maryland Steel Company, a constituent company of the Pennsylvania Steel Company, is located within 12 miles of Baltimore, where it owns its own wharves, terminal facilities, railway and equipment. In the marine department of this company have been turned out some of the largest vessels, including a number of torpedo boat destroyers, and the noted Dewey dry dock.

The exhibit of railway apparatus of these two companies at the convention is in charge of H. F. Martin, general manager of sales, assisted by sales agents from all the company's offices in this country and abroad. Great interest has been taken by railway delegates in the Manard pinless switch exhibited. This switch is a solid casting of Manard steel, a high grade manganese steel of superior quality. It is so designed and constructed as to prevent any possibility of a depression at the heel which has a bearing surface of 80 sq. in. and holds the tongue in place on a manganese base. Other apparatus shown includes solid Manard crossings, an anvil face frog equipped with "Never Turn" split bolts, a number of types of switch stands, crusher plates, manganese gears and pinions.

\* \* \*

It is rather unusual for a manufacturer to include in his exhibit an article that has actually been in the track under service, because track material is subjected to such rough usage that it is worth little more than scrap when removed from service, but in the space of William Wharton, Jr. & Company, Inc., a frog is shown that has been in use and worn out, and then restored to a condition practically as good as new. This is one of the features of Wharton manganese steel frogs of the class A, B and C types. After having outworn a number of ordinary frogs, they can be restored by a patented process, for a second term of service, at a comparatively small expense. Hundreds of frogs have been treated in this way, and in some cases the same frog has been restored twice, with excellent results.

\* \* \*

The Chisholm-Moore Manufacturing Company, Cleveland, Ohio, is exhibiting a line of Cyclone high-speed hoists of from ½ to 20 tons capacity. This is said to be the only hoist on the market having roller bearings. The minor bearings have bronze bushings. It is also showing the "Matchless" trolley carriage without flanges on the wheels, but with vertical side rollers on eccentric shafts, adjustable to any size of I-beam. A motor-driven model showing the gears of a 5-ton hoist in motion is attracting attention. Another feature of the exhibit is a model of the new No. 6 Ludlow track drill which has steel cut gears. This drill raises 13½ in. from the highest to the lowest point, the operation being accomplished by throwing in a clutch. At the highest point it is 4 in. above the pavement. The exhibit is in charge of H. E. Dickerman and W. E. Ludlow.

\* \* \*

The "Walkover" car seat of the Hale & Kilburn Manufacturing Company of Philadelphia is shown in various forms and upholstered effects in Spaces 312, 365, 367. Several new features are presented, including the new steel frame Chicago electric car seat now in use in over 2000 cars in that

city. The new type of Pacific interurban seat, finished in steam railroad style with high head roll back and spring-edge cushion, polished steel aisle end and grip handle, is believed to be the handsomest car seat so far shown, and meets with universal praise for its elegance, simplicity of mechanism and operation, and light weight. The all-steel car door, of which over 1000 have been built for the Philadelphia Rapid Transit Company's "Pay-within" cars, is likewise shown, together with samples of the steel frame sash as supplied the 50 all-steel electric cars for the Chicago Railways Company. The company is represented by H. T. Bigelow, A. F. Old and C. W. Laskay.

\* \* \*

The D & W Fuse Company, Providence, R. I., is exhibiting in addition to its standard lines of fuses and Deltabeston magnet wire, an entirely new line of field and armature coils. These coils are wound with Deltabeston wire, and are insulated throughout with pure asbestos materials, treated by a new process which renders them both heat-proof and moisture-proof. There are several different types of coils on exhibition, and this company is prepared to estimate upon coils of every description. In addition to round wire, the company is now manufacturing square and ribbon wires with the Deltabeston insulation. It is also showing a new line of 2500-volt junction boxes for multi-phase circuits with fuses of very much larger dimensions for this severe service. The boxes are of the selective type design, which makes it possible to open the box and examine the fuse without opening the circuit or to remove the fuse in the cover at will by simply turning the insulating handle exposed on the surface. The bases in these boxes are made of a specially prepared filled wood, which has been found to possess the best insulating qualities, to be far stronger than porcelain, and more desirable for use in equipment of this kind. The leakage surfaces have been determined by careful experiment to be ample and no appreciable leakage will occur below 6000 volts.

\* \* \*

Kerite Insulated Wire & Cable Company, New York, has on exhibition in Spaces Nos. 414 and 416 a display of car wire, transmission cables for aerial, underground and submarine purposes, etc. Among the most interesting of the exhibits are cables which have been in service as far back as 1875 and are still good to-day. Among other things that should prove interesting to delegates would be a glance at the largest perfect biscuit of Up-River fine Para rubber ever brought into this country, which weighs 763 lb. Among other exhibits is a section of the Panama submarine cable, which was manufactured in one length of 50 miles by the Kerite Company and furnished the Central South American Telegraph Company, and which connects the Atlantic and Pacific cable of that company. This cable is being laid on the ground across the Isthmus from Colon to Panama and upon the completion of the canal will be thrown into the water. In high-power transmission cables the company exhibits pieces of the three-phase submarine cable and three-phase leaded cable furnished the Pennsylvania Railroad in connection with its Camden-Atlantic City electric line. Delegates are asked to investigate closely the merits of the Kerite insulated tape, for which it is claimed that after many years of service none has ever been known to dry out under the most trying conditions. The company is represented by P. W. Miller, R. E. Butrick and J. A. Reiton.

\* \* \*

The Electric Railway Improvement Company is making about 50 practical demonstrations of bond application daily at its booth in the Auditorium. The bonding car used in making these demonstrations is adapted for use on either standard or 3-ft. 6-in. gage track. The company announces that it has recently made shipments of leased cars to the following electric railway companies: American Railways Company, Philadelphia, Pa., one car adapted for 3-ft. 6-in.,

4-ft. 8½-in., and 5-ft. 2-in. gage track; Illinois Traction Company, Champaign, Ill., duplicate car of former order; Norfolk & Portsmouth Traction Company, Berkeley, Va.; Union Railway Company, New York City, duplicate car of former order; Pacific Gas & Electric Company, Sacramento, Cal., one car.

\* \* \*

G. M. Gest, the well known conduit contractor, and the New York Pole Company, of which he is president, have an exhibit together in Space 29. A sample of an old sawed-off iron pole reinforced with steel bars and filled in with concrete is exhibited, showing the compact and solid nature of the reinforcement. H. H. Stannard is in attendance at the convention.

\* \* \*

National Lock Washer Company, Newark, N. J., has an instructive exhibit in Space 144, showing full-size models of its automatic car curtains, equipped with the National cam and balance, protected groove curtain fixtures; also samples of the National lock washer. The company is represented at the convention by F. E. Archibald and John B. Seymour. The many friends of W. D. Dodd, the president of the company, regret his inability to be present at the convention.

\* \* \*

The Cooper Heater Company, Dayton, Ohio, in Space 71, has on exhibit one of each size of its new and improved hot water car heaters. This heater has many improvements over other types of hot water heaters and owing to its small size and high efficiency it is possible to apply the apparatus to the smallest city car as well as the large interurban car. It is claimed that a large saving can be made over the cost of heating cars with electric heaters by the use of this apparatus. The company is represented by W. L. Blackwell and W. E. Hinmon.

\* \* \*

Among the unique exhibits at the convention is the booth of Gulick-Henderson Company, Space 609 in the Annex, where may be seen the results of various interesting investigations relative to the quality of materials for traction service. This company makes a specialty of engineering inspection of various materials, such as wheels, axles, rails, cars, bridges, and in fact all materials used in railway service. The company is represented by Henry Gulick, president, and W. O. Collins, vice president.

\* \* \*

The Planet Company, Chicago, Ill., has an attractive exhibit of its car curtain fixtures at Booth 374 in the main auditorium. This company has been represented at the Master Car Builders' Association conventions for several years, but has never before been represented at the electric railway conventions. The curtain fixtures manufactured by this company are of an exceedingly substantial construction. They are designed so that passengers on cars cannot remove them from the grooves. Messrs. Convey and Summers are representing the company.

\* \* \*

The St. Louis Malleable Casting Company, St. Louis, Mo., is exhibiting at Spaces 621-623 a new line of malleable iron cross-arm attachments and overhead line specialties. Since May this company has received orders for 60,000 "Way" cross-arm attachments. This attachment provides a means for attaching insulators to cross arms in a manner absolutely secure without the necessity of weakening them by boring holes of any kind. In fact, the "Way" bracket added to an arm increases its strength and adds to its life. This company also makes a specialty of railway and electrical castings and has contracts with some of the largest manufacturers and street railway companies to make all their malleable iron parts. R. H. Manwaring, general sales manager, and Duncan Bond, local agent, are in attendance prepared to answer all inquiries.

The National Railroad Trolley Guard Company, New York, is represented at the convention by C. R. Ellicott.

\* \* \*

The Union Electric Company of Pittsburgh, Pa., is represented at the convention by John P. Provost, George W. Provost and T. M. Cluley.

\* \* \*

The Holophane Glass Company, New York, is represented at the convention by H. M. Lauritzen, the representative of this company west of Denver to the Pacific coast and British Columbia.

\* \* \*

The Wright Wrench Manufacturing Company, Canton, Ohio, is exhibiting several types of its quick adjustment wrench. This wrench can be used in either hand and is made in a large number of sizes.

\* \* \*

The National Brake Shoe Company, Chicago, Ill., is represented at the convention by B. A. Johnson. The company is not making an exhibit this year but expects to make an exhibit at future conventions.

\* \* \*

Heywood Brothers & Wakefield Company, Wakefield, Mass., is showing an extensive line of seats for city and interurban cars, as well as reed parlor car chairs. Bertram Berry is representing the company.

\* \* \*

Dossert & Company, New York, are represented by H. B. Logan and W. A. Cowling in the interest of Dossert cable joints and specialties. Although the company has no exhibit, Mr. Logan and Mr. Cowling are meeting many friends.

\* \* \*

The Trolley Supply Company's exhibit of Peerless trolley bases and retrievers and the Ideal trolley catcher is located in Spaces 162-64. The Peerless trolley base, which is being shown, has made an enviable reputation for service on high-speed railways.

\* \* \*

The interests of the Columbia Machine & Malleable Iron Company, Brooklyn, N. Y., are ably taken care of by W. R. Kerschner. The many friends of John G. Buehler, the president of the company, regret that he was unable to be present at the convention.

\* \* \*

W. T. Van Dorn Company is showing at its booth four of its standard types of street and interurban car couplers and two new types of couplers which have never before been exhibited. The company is now prepared to furnish couplers for every class of city and interurban service.

\* \* \*

Electric Railway Equipment Company, Cincinnati, Ohio, is exhibiting its improved types of "Sure Grip" catenary construction material, and also a complete line of standard overhead trolley material and "Wire Lock" swedged joint poles. The entire exhibit is well worth inspection by those interested.

\* \* \*

W. R. Kerschner Company, Allentown, Pa., is represented by Mr. Kerschner himself. This company handles the products of the Columbia Machine Works & Malleable Iron Company, Catskill Foundry & Machine Company gears and pinions, Traction Equipment Company car resistances and second-hand car equipment.

\* \* \*

At the booth of the Standard Paint Company, New York, in the balcony of the Auditorium, Space 404, Charles E. Smith, manager of the electrical department and Messrs. Beckman, Thomas and Pfeiffer are explaining the merits of the specialties of this company—P. & D. and S. P. C. Novac impregnating compounds; insulating varnishes and tapes; Ruberoid roofing for cars, car houses, power houses, substations and repair shops; Ruberoid flooring in red,

brown and green colors for waiting rooms, offices, stations, power houses and substations. Novac impregnating compound is a new product. Its constituent elements are such that coils can be treated without the aid of impregnating apparatus, but giving the same results.

\* \* \*

The "Avenarius" Carbolineum Wood Preservative Company, Milwaukee, Wis., and Portland, Ore., has a display in Space 701 of its wood preservatives as used on trolley poles and ties. The "Avenarius" brand is the old, original and genuine Carbolineum. This company is represented by B. F. Vreeland of Denver.

\* \* \*

S. A. Benedict of the J. P. Devine Company, Buffalo, N. Y., manufacturers of Passburg vacuum dyeing and impregnating apparatus, is attending the convention in the interest of his company. While no exhibit is being made, Mr. Benedict is armed with a plentiful supply of the company's new catalog, which describes some of the more recent types of machines and contains a long list of users.

\* \* \*

Those who are interested in a perfect lubrication for armature and motor axle bearings should visit Space 622, where the Traction Lubricating Company, Chicago, Ill., has an exhibit. This lubricant is a solidified oil mixed with old waste. It stands a high heat as well as a low temperature, and is not affected by climatic conditions. One application lasts from 30 to 90 days according to the size of the box or motor.

\* \* \*

The exhibit of the R. D. Nuttall Company as usual entertains many visitors, who are welcomed by F. A. Estep, president of the company. The railway appliances of R. D. Nuttall have been for years the standard and Nuttall gears, pinions and trolley harps are used wherever a street car turns a wheel. The Nuttall exhibit is located in the southern part of the Westinghouse pagoda in the center of the Auditorium.

\* \* \*

W. J. Jeandron, sole sales agent for Le Carbone Company, Paris, France, is showing a full line of carbon brushes for traction motors, generators, rotaries, etc. He is also exhibiting a full line of carbon contacts for circuit breakers and lightning arresters and a large variety of telephone carbons. Le Carbone products have been widely adopted by many traction companies, including the Denver City Traction Company. Mr. Jeandron is assisted by E. S. Taylor.

\* \* \*

The exhibit of the Coleman Fare Box Company, Buffalo, N. Y., includes the original No. 1 type box used by the International Railway Company, Buffalo, N. Y. The No. 2 type used by the Chicago & Southern Traction Company, the Detroit United Railway Company and the Buffalo & Lake Erie Traction Company; also the No. 3 type for one-man operation and the new No. 4 box, which is termed the 5½-in. size. Samples of the Coleman hand fare box, which is used in many Canadian cities and several cities in the United States, is also shown.

\* \* \*

The Western Lumber & Pole Company, Denver, Colo., has an exhibit in Space 701 of eight large genuine Idaho red cedar trolley poles. They reach to the ceiling of the hall, and attract much attention. This company is also exhibiting an Oregon fir traction tie, treated with "Avenarius Carbolineum," the German wood preserver. This tie bears a certificate from the Southern Pacific Railroad that it was in the roadbed, in actual use, from 1900 to 1907, a period of seven years. The tie has been cut for nine years and is as good and sound to-day as when first sawed and treated. "Avenarius Carbolineum" is also used for treating the butts of trolley poles, cedar or any other kind of wood. The company is represented by B. F. Vreeland, W. H. Lewis and M. G. Graff.



The exhibit of the Crouse-Hinds Company, Syracuse, N. Y., includes two new specialties just placed on the market, the luminous arc headlight and a multiple break for trolley service, to be used in place of snap switches, which are often a source of trouble.

\* \* \*

The National Lead Company, under its well-known emblem of the "Dutch Boy Painter," has an interesting exhibit showing the various steps in white lead manufacture from the raw ore to the finished product. The booth is in charge of W. B. Sale of the St. Louis branch.

\* \* \*

The Midvale Steel Company has moved its Denver staff to its booth space 239, where delegates are welcome to have correspondence or any other matters attended to by the company's stenographers. Delegates and visitors are requested to make use of this staff without hesitation.

\* \* \*

The Forged Steel Wheel Company of Pittsburgh, Pa., is exhibiting several sizes of its car wheels. These wheels are forged in dies from a sheet of rolled steel, which is considerably larger than the finished wheel. The treads and flanges are compressed by a pressure of 10,000 tons to harden them clear through and thus increase their durability.

\* \* \*

At the exhibit of the National Brake Company are G. S. Ackley and a corps of able assistants, among whom is Alphonso A. Wigmore of Los Angeles, Cal., the company's Pacific Coast representative. The company has on exhibition the Ackley adjustable brake which has been adopted for use by more than 150 railways, of which 75 are in Europe.

\* \* \*

To operating men the exhibit of the Eureka Tempered Copper Works is especially interesting. The exhibit includes several types of trolley wheels and commutators. This company makes a specialty of manufacturing large commutators for generators and rotary converters. The representatives in attendance at the convention are O. C. Hirtzel and Fred Rundell.

\* \* \*

The insulating department of the Standard Varnish Works has an exhibit in Space 382. The representatives of this department are in attendance and will be pleased to explain to those interested in this subject the various insulating processes for treating electrical windings. Special attention is given at this convention to electrical railway equipment.

\* \* \*

In its convention exhibit this year the Sherwin-Williams Company lays special stress on its car-painting systems, from six-day work up. Attractive samples of methods of car painting are shown in connection with the full line of paints and varnishes which the company manufactures. The representatives of the company are E. M. Williams, Cleveland, Ohio; F. A. Elmquist, New York; Henry E. Billau of Chicago; E. S. Donnelly, Dallas, Tex., and F. E. Cole, Denver.

\* \* \*

At the booth of the Electric Traction Supply Company, Spaces 207-213, may be seen a complete line of standard conductors and special ticket punches for all kinds of service, manufactured by the Bonney-Vehslage Tool Company, New York. This line comprises all the best known types of punches. The dies are of tool steel and hardened by a special process which, together with the careful selection of other materials used, makes these punches durable and serviceable.

\* \* \*

Consolidated Car Fender Company, Providence, R. I., is showing as a special feature of its exhibit a perfected automatic air drop device applied to its fender and wheel guard. The fenders and wheel guards of this company can be operated in all or any one of three ways, by an apron, by the

motorman or by a special automatic attachment to the emergency air brake equipment. An ingenious and simple sand box is also exhibited. The special feature of this sand box is that the sand cannot leak or clog. In service the box has proven satisfactory. A. G. Thornley, general manager, and George H. Hollingsworth are attending the convention in the interest of the company.

\* \* \*

The Jewett Car Company, Newark, Ohio, expected to bring to Denver one of the 10 new 60-ft. high speed steel under frame interurban cars, which it is building for the Salt Lake & Ogden Railway. Owing to a delay in the delivery of trucks and electrical equipment the car could not be completed in time, so no formal exhibit is being made. The company is represented at the convention, however, by Edwin Besuden, sales manager, who has with him a model of a new self-centering radiating M. C. B. draw bar with remote disconnecting levers.

\* \* \*

Couch & Seeley, Boston, Mass., are exhibiting an automatic machine for counting and packaging coin. This machine is small and compact, being only 20 in. in diameter and 16 in. high. There are two registers on the machine, one counting from 0 to 10,000 and the other from 10,000 to 0. With the two registers any method of checking accounts of collectors, conductors and cashiers can be easily devised, the machine acting in the double capacity of bookkeeper and money packager simultaneously. With only one handling there is no chance of error between the time the cash is delivered until it is deposited. The company is represented by C. N. Smith.

\* \* \*

The Pantasote Company, New York, is showing agasote with water running continuously over the board and down gutters of the same material. The boards are the same which have been displayed at the last two conventions. Many samples of agasote are shown in different shapes and finishes. Fire-resisting agasote only 3-16 in. thick has withstood a flame of 6300 deg. Fahr. for one minute, while in the same test it took only 20 seconds to cut through 3/4-in. steel. Pantasote is also shown in various forms and colors in curtains and upholstery. Some of the curtain materials are shown in regular frames. Samples of both agasote and pantasote are furnished to those who desire them for trial. The company is represented by John M. High, W. A. Lake and A. S. Barrows.

\* \* \*

Among the interesting items shown by McCord & Company, Chicago, are the following: A 3 1/2-in. by 5 1/2-in. arch bar truck journal box as furnished the Cuban Railways, where the McCord journal box is standard. A 3 3/4-in. by 7-in. box, with sections cut out of sides and out of lid, better to illustrate the action of the coil spring, center bearing lid, in its tendency always to hug the face of the box at all points. A 5 1/2-in. by 10-in. arch bar box, with pinless lid, which is the company's latest innovation. This avoids absolutely the loss of lids because in its application the lid is so interlocked as to make necessary for removal one distinct movement which cannot occur in service. A 5-in. by 9-in. cast steel passenger box which is used quite extensively on all-steel passenger cars on steam railroads. A 4 1/4-in. by 8-in. malleable iron street railway box with steel inserts as used on the 650 "pay-as-you-enter" cars of the Chicago Railways Company, which have been in service now about 8 months. The gray iron or semi-steel street railway box shown is one which has just been ordered by the Chicago Railways Company for application to 350 additional cars. These boxes are arranged to admit the National equalizing wedge, which this company is also exhibiting, and which, together with the McCord box, made such a wonderful record that not one of the Chicago Railways' cars has experienced a hot box since all the 650 cars were put in service.

Among recent orders received by the American Mason Safety Tread Company are the following: Safety treads for the Mobile (Ala.) Light & Railway Company; Karbolith flooring for the Boston Elevated Railroad Company, and for new electric motor and trail cars now building for the New York, New Haven & Hartford Company by the Standard Steel Car Company.

\* \* \*

American Locomotive Company, New York, is represented by William Wampler at the convention, who is taking advantage of the opportunity to show the delegates the American Locomotive Company's trucks in service on the Denver & Interurban Railroad. The management of the latter company has permitted one of its cars to be placed on the exhibit tracks. The body of the car has been jacked up so that the details of the truck construction are plainly shown.

\* \* \*

The Ford & Johnson Company, Chicago, Ill., which is showing a full line of car seats, is among the largest makers of chairs and furniture in the country. The car seat business is a new line with this company, but it has a new factory equipped for all kinds of railroad seating and is going into the business in a large way. The company may be expected to be very successful in its new work, as it has behind it a large and perfected organization with over 40 years of experience.

\* \* \*

Transfer Issuing Machine Company, Boston, Mass., has something entirely new on exhibition in the shape of a transfer issuing machine. It is a neat, simple mechanism, the salient points of which are that it automatically prints upon the transfer, at the time of actual issue, the month, the day of the month, the hour of the day, the number of the machine issuing the transfer and the destination and transfer point. The transfer cannot, however, be issued until it is paid for by depositing a coin into the machine.

\* \* \*

The Standard Motor Truck Company, Pittsburgh, Pa., exhibits one of its C-60 high-speed Interborough trucks and one O-50 city and suburban truck. These trucks are a part of an order for the Oklahoma Railway Company and are equipped with Standard roller-bearing center plates and Standard automatic brake slack adjusters. The company also shows four aluminum models of trucks, one of which is its C-100 A type, as built for the New York, New Haven & Hartford Railroad. An aluminum model of its slack adjuster shows the internal mechanism of this device which is in use by many railway companies.

\* \* \*

The Dearborn Drug & Chemical Works has a handsomely fitted booth in the center of the Auditorium, consisting of four exhibit spaces. The central feature is a beautifully illuminated fountain spouting perfume. Scattered about are comfortable chairs, and the booth forms a convenient meeting place for the friends of the company. Those in attendance are George R. Carr, vice president, Chicago; H. G. McConaughy, New Jersey manager, New York; D. E. Cain, I. H. Bowen and W. S. Weaver of the Denver office. Robert W. Carr, Chicago, president of the company, and Grant W. Spear, vice president and Eastern manager, New York, who have not missed a convention for 10 years, could not attend this year, greatly to their regret. Many inquiries were made for both of these gentlemen. All of the Dearborn people who are in attendance report that business, both domestic and foreign, is extending rapidly.

\* \* \*

The Stromberg-Carlson Telephone Manufacturing Company, Rochester, New York, has an interesting exhibit of railway semaphore signaling apparatus in Space 133. The representatives present are A. M. Hanbrich, manager of the Chicago office; H. W. Lucia, assistant chief electrical engineer; and C. P. Button, special represen-

tative. The system being demonstrated is the well-known signal which was introduced, installed and sold to numerous interurban railways through the United States by the Telegraph Signal Company of Rochester, New York. The Stromberg-Carlson Telephone Manufacturing Company has now secured the exclusive manufacturing and sales rights for this signal system and the skill of its engineering department has in the past few months brought this system up to a high standard of perfection in construction and operation. With the introduction of this system a positive means of enforcing obedience to train orders is afforded. This company is also showing a complete line of telephone equipment, including mine telephones, portable car telephones, portable test sets, desk telephones and jack boxes.

\* \* \*

A thoroughly developed carbon brush, the New Laclede, exhibited by the National Carbon Company, Cleveland, Ohio, in booth No. 372, is of great interest to the visiting railway men. Not only are many new brushes shown, but also samples that have seen six to eight months' service, indicating the life of this brush will be 75,000 to 200,000 miles. This means a remarkable saving in the cost per 1000 car miles. As regards commutator wear, railways which had figured on slotting their commutators once a year find it will be unnecessary\* with this to slot oftener than once in from four to five years. The uniformity of the brush is proven by the fact that tests on the same motor on various roads have shown practically the same wear and the same excellent condition of the commutator. These gratifying results are the outcome of the thorough investigation by the company's brush engineers and chemists, as well as the improvement in apparatus and operating conditions. With this brush it is not necessary to slot the commutator on the interpole motors, as demonstrated on several of the largest roads. A feature of particular interest to the engineers are the photographs of some of the special machines built by the National Carbon Company to test all the different characteristics of carbon brushes, in line with the suggestions made at the previous conventions and the experience of the company's engineers and chemists. Brush engineers are present at the exhibit to select brushes to fit the conditions of operation on any road and to discuss brush problems.

\* \* \*

United States Wood Preserving Company, New York, represented by Alexander Reed and Harry B. Langa, has an exhibit at Spaces 82 and 185 in the Auditorium, where it is showing the construction of U. S. wood block pavements. These blocks are laid on a concrete foundation 4 in. to 6 in. deep, composed of a 1-3-6 mixture of concrete. On top of this foundation is spread a ½-in. sand cushion. After the latter is drawn to a true surface by a template 3½ in. below the surface of the blocks, the blocks are laid directly upon it, grained vertically. The blocks are driven back tightly every sixth row and then rolled with a five-ton steam roller or tramped until they present a true, even surface. The joints of the blocks then are filled with sharp screened sand and spread with ½-in. sand dressing on top. The street is then ready for traffic. The process of manufacturing U. S. wood blocks either from Southern long leaf yellow pine or Southern black gum is first to saw the 3-in. plank into blocks 3½ in. deep. The blocks are then loaded into caged cars, after which they are run into the creosoting cylinder. Dry heat is then applied under pressure until the wood blocks are heated to a temperature of 215 deg. F. to kill germ life. After this a vacuum is applied until all air and moisture are extracted. Under the vacuum the cylinder is filled with creosote oil of a specific gravity of 1.12, combined with melted resin. Pressure pumps are then applied and the mixture is forced into the blocks until they have taken 20 lb. of mixture per cu. ft. of timber. The pressure is then released and the cylinder allowed to cool and the blocks withdrawn. Many progressive street railways in this country are adopt-

ing wood blocks in preference to asphalt, brick or granite, as it is claimed that they maintain the tracks in better alignment and last longer.

### AMERICAN BRAKE SHOE & FOUNDRY CO.'S EXHIBIT

A splendid object lesson in the value of standardization is the unique exhibit of the American Brake Shoe & Foundry Company. On a large white board is mounted a great variety of brake heads of malleable iron construction as used on the many different kinds of trucks, but all arranged to take either the narrow gage or wide gage shoe adopted as the standard by the American Street & Interurban Railway Association. The American Brake Shoe & Foundry Company has good reason to feel proud of this display as it has taken such a prominent part in the development of these standards. Since the standards were adopted two years ago, about 50 per cent of the American street and interurban railways have become actively interested in this question and have taken steps to standardize their equipments as quickly as practicable. The new shoes are so designed that the wearing factor is increased from 50 per cent to 80 per cent, aside from the advantage of uniformity in equipment. Through its engineers the company is prepared to undertake the standardization of any property, supplying heads which will take the standard shoe without disturbing any part of the present brake mechanism. In designing these heads the company endeavors to correct the uneven wear which existed in the hanging of the old type.

### WESTINGHOUSE COMPANIES' EXHIBIT

The Westinghouse Companies' exhibit is in the center of the Auditorium Hall, occupying a space of approximately 2500 sq. ft. The space has been transformed into a replica of an Indian pagoda, flanked by Grecian columns. At each end there is a dome. The roof is covered with garlands of artificial flowers, while just beneath the roof rows of potted ferns and plants bank the ceiling. The companies represented in this structure by their displays are the Westinghouse Electric & Manufacturing Company, the Westinghouse Traction Brake Company, the Westinghouse Machine Company and the R. D. Nuttall Company. In the exhibit of the electric company there is an array of railway motors, from the ordinary size used on street cars, up to the large 125-hp motor for interurban and main line service. There is a complete line of material used for all purposes in electric railway service, and of motors used for operating machine tools in manufacturing and railway shops. In the exhibit of the Westinghouse Machine Company, there is a complete electric train lighting plant, consisting of a 40-hp generator and a steam turbine. There are also two Le Blanc condensers and other auxiliary apparatus. The Westinghouse Traction Brake Company shows a complete set of air brake apparatus for stopping one car, two cars, three cars, or a train of electric cars. Auxiliary air brake apparatus is also shown. The R. D. Nuttall Company displays a complete set of trolley harps, trolley bases, gears and pinions. The Westinghouse Electric & Manufacturing Company also has on exhibition, outside of the Auditorium, a car equipped for the a. c. single-phase system. This car will be in operation on the Denver & Interurban Railroad, between Denver and Boulder, as soon as the construction of the bridge over the Twenty-third Street viaduct is completed. This a. c. system is the same which is used on the main line of the New York, New Haven & Hartford Railroad between New York and Stamford, the Spokane & Inland Empire Railway and several other roads in this country, France, Sweden, Germany and Italy. Besides the 25 members of the office force of the Denver district of the Westinghouse Companies, of which L. M. Cargo is manager, the companies are repre-

sented by men from Pittsburg, New York, Boston, Baltimore, Philadelphia, Cincinnati, Chicago, Kansas City, St. Louis, San Francisco, Los Angeles and Columbus, Ohio.

### EXHIBITS OF THE ALLIS-CHALMERS COMPANY

The exhibit of the Allis-Chalmers Company, Spaces 200-210 and 251-258 in the Auditorium Hall, should be visited by every delegate interested in the latest developments in air brakes, railway motors and controllers. There are on exhibition one two-car equipment straight-air emergency brake; one two-car equipment of quick-action automatic brakes; one type R 75 hp street railway motor and one type S-4 controller having a capacity of four 40 hp motors. All of this apparatus has new features never before shown.

The new railway controller, which is of the series-parallel type, has special molded main and reverse drums and the cut-out switch is so arranged that when two motors are cut out the other two may be run both in series and parallel. It also has two blow-out coils which create an especially strong field. The usual interlocks between the main and reversing drums are also embodied in this controller and the fingers are of a special construction which avoids any tendency to buckle. They are provided with massive copper contacts.

The usual connecting board is omitted, the connections from the resistance and motor loads being made directly at the finger terminals.

The fields of the motors are reversed, instead of the armatures, which gives a large potential between adjacent reversed fingers and obviates the tendency to arc from finger to finger.

Delegates and manufacturers are invited to participate in the contest for the handsome souvenirs to be distributed on Thursday. The souvenirs are well worth an effort to secure. The only requirement is the filling out of small cards showing the estimated number of turbine blades contained in a small glass case. Any number of guesses may be recorded.

### ADDITIONS TO LIST OF EXHIBITORS

- R. D. Nuttall Company, Pittsburg, Pa., Spaces 268, 319—Gears, pinions, trolleys and trolley parts. Represented by F. A. Estep, G. W. Provost, T. M. Cluley, C. J. Mayer, J. V. E. Titus, M. Berg, J. W. Porter, E. C. Mason.  
Rooke Automatic Register Company, Providence, R. I., Space 140—Rooke automatic register and Rooke type of stationary fare box for Pay-As-You-Enter cars. Represented by R. S. Rooke.

\* \* \*

Wonham, Magor & Sanger, New York, advise that on October 2 the Chicago Railways Company adopted the H. B. Universal Life Guards as standard for its entire system, after having had 75 cars fitted with this life guard and tested in a 60-day trial.

\* \* \*

The Barber car, from York, Pa., makes trips every 15 minutes, starting on the hour, between the corner of Sixteenth and Arapahoe Streets and Globeville. Convention people are invited to take a ride and inspect the car.

\* \* \*

Goldschmidt Thermit Company will give a demonstration of the Thermit process of rail welding at 4:30 this afternoon.

\* \* \*

Yesterday afternoon's sight seeing automobile trip for ladies added another to the entertainment committee's triumphs. There were 181 ladies in the party, in charge of W. J. Walsh of the Galena-Signal Oil Company, Chicago, for the committee. The autos held parties of from 12 to 20, and a guide and lecturer accompanied each car.

## EXHIBIT OF THE GENERAL ELECTRIC COMPANY

The General Electric Company, Schenectady, N. Y., has a very large and complete exhibit of street railway electrical and air brake equipment and overhead line material. Among many new types being shown this year are the types G. E. 219 and G. E. 216 railway motors. These motors are of the commutating pole split frame and box frame types respectively. Both are rated at 50-hp, 600-volt circuit and 40-hp, 500-volt circuit. They are designed to take the Engineering Association standard axles and gears. The G. E. 214 railway motor is of the commutating pole, box frame type, with a rated capacity of 75-hp at 600 volts. It is likewise designed for the Engineering Association standards. Another new motor shown is the G. E. 88, which is of the non-commutating pole design. This is made either with a box frame or a split frame and has a rated capacity of 40 hp at 500 volts.

A complete equipment of automatic type M control for 1200-volt d. c. car is exhibited. This equipment includes the essential pieces of apparatus for the control of four 75-hp 600-1200-volt motors. The contactors, reverser, circuit breaker, master controller, etc., are practically standard 600-volt apparatus, with the exception that all parts carrying the main current for the motors are insulated for 1200 volts. The operating coils are energized from 600-volt current furnished by the dynamotor, which consists of an armature with two separate windings and two commutators, constituting in effect a small motor generator with the two commutators connected in series across the 1200-volt circuit. A tap connected between the two commutators provides current for operating the contactors, etc., at 600 volts.

Two new brake equipments are shown. One is an emergency straight air brake equipment complete for operative motor and trail car. This equipment is provided with quick service valves which admit and exhaust air to and from the brake cylinder directly from the main release and to the atmosphere respectively without passing through the motorman's valve. The operation of the brakes in both application and release is extremely rapid, even in trains of three or four cars. The emergency straight air brake system is particularly adapted for cars which are required to operate both singly and in short trains.

The other brake equipment consists of two complete variable release automatic brakes for motor cars. This equipment is essentially an automatic air brake equipment with special triple valves and other details to provide for quick service application, high pressure emergency application, quick recharge of auxiliary reservoirs and graduated release. This equipment is specially adapted for the operation of electric train service where cars are always run in trains. It operates interchangeably with the Westinghouse graduated release brake system.

Two new types of air compressors designated as CP 27 and CP 28 are shown. The CP 27 compressor has a piston displacement of 15 cu. ft. per minute at 600 volts against 90 lb. pressure. This compressor is shown disassembled, and also fitted with special cover to permit observation of the lubricating system when compressor is operating. The location of all bearings for both motor and compressor in one casting, location of gear in center of crank shaft, and automatic lubrication of all bearings from one source of supply are important improvements. The CP 28 compressor has 25 cu. ft. per minute piston displacement at 600 volts against 90 lb. pressure. It is of the same design as the CP 27 compressor.

Among the miscellaneous equipment is an aluminum cell lightning arrester for 12,500-volt, three-phase ungrounded neutral circuits and K 35 controller, which has a capacity for four 50-hp 500-volt motors. This controller is built with a bridge connection between the series and parallel positions and is fitted with an improved blow-out.

Two types of steam flow meters are exhibited. One is an indicating meter which is operated by unbalanced pressures on two sides of a funnel block which screws into a steam pipe. The unbalanced pressures from the two sides of a mercury U-tube cause the movement of the indicating needle. This meter is quickly adjustable for any size pipe, boiler or superheat. The recording steam flow meter operated on substantially the same principle as the indicating meter except that the U-tube forms the beam of the balance. The displacement of the mercury moves the balance against a counter weight and this moves the indicating pen over a multiplying mechanism. The record is made on a paper roll moved by a positive chronograph. The meter automatically compensates for variations in boiler pressure and can be quickly adjusted for any change or any superheat or other operating conditions.

The top mast motor-driven automatic block signal, such as is used on steam railroads, is shown. The signal is operated by alternating current controlled by a. c. track and line relays. Alternate blocks are energized at different frequencies. Both rails form a continuous circuit for the return of power current and no reactance bonds are necessary.

The car equipment exhibited consists of MR-12-B circuit breaker, magnetite arc headlight, car lighting switch and cut-out, malleable iron controller handles, motor lead connection boxes, R. G. car rheostats and solid gears and split gears for G. E. motors. A complete line of rail bonds and overhead material is exhibited on large panels at one end of the exhibit.

## THE BARBER CAR IN DENVER

No delegate to the convention should fail to take a ride on the latest Barber car which is being operated on the one mile of standard gage track from Sixteenth and Arapahoe Streets to Globeville. The car starts on the hour and every 15 minutes thereafter. This car, which is thus serving as a live exhibit, was shipped direct from the works of the Barber Car Company, York, Pa., and placed in operation without any preliminary runs whatsoever. The running qualities, power economy, roominess, perfect ventilation and other advantages of this car are too well known to call for an extended description, but those who are familiar only with the earlier models will be pleasantly surprised to see how greatly the exterior has been improved through the use of arched side and vestibuled windows. The trucks have been materially strengthened for high speed service by the application of bridge trusses for the side framing and as in the present case a 34 ft. car can be mounted on a truck of only 10 ft. wheel base instead of 12 ft. as formerly. The Denver exhibit car is handsomely finished in yellow and brown. It carries two 40-hp motors, hydraulic brakes. Providence wheel guards, Wilson retrievers, Stanwood steps and Van Dorn couplers. The ceiling is painted with a highly reflecting enamel which gives the interior a most brilliant appearance when the lights are on. The seats are of the Wheeler reversible rattan type with plenty of room beneath as the heaters are set in the walls of the car. The windows are absolutely non-rattling and by means of ratchets may be raised to the height most convenient for the passenger. The fares collected are rung up on an Ohmer register. The headquarters of the Barber Car Company are at space No. 615-17-19, where Guy Webster, general manager of the company, and E. A. Barber, inventor of the car, are prepared to receive visitors. Mr. Barber, in particular, is available at any time as a guide for those who wish to study the car in detail.

The Great Salt Lake has an area of 2500 sq. miles. It is more than 4000 ft. above sea level and has a mean depth of about 60 ft. The water contains 22 per cent of solids and it is impossible for a human being to sink in it.