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NEW YORK—OCTOBER 10, 1911.—ATLANTIC CITY

### PROGRAM TO-DAY

#### CONVENTION MEETINGS

- 9.30 a.m. Opening Meeting of Accountants' Association, Chalfonte Hotel.
- 9.30 a.m. Session of Engineering Association, Marine Hall, Convention Pier.
- 9.30 a.m. Session of Transportation & Traffic Association, Greek Temple, Convention Pier.
- 9.30 a.m. Session of Claim Agents' Association, Traymore Hotel.
- 11.00 a.m. Joint Session of Engineering and Transportation & Traffic Associations, Marine Hall, Convention Pier.
- 2.00 p.m. Opening Meeting of American Association, Greek Temple, Convention Pier.
- 2.00 p.m. Session of Claim Agents' Association, Traymore Hotel.

#### ENTERTAINMENT

- 10.00 a.m. Obstacle Golf, Lawn of Marlborough-Blenheim Hotel.
- 11.30 a.m. Concert by Leps and His Symphony Orchestra, Lobby, Convention Pier.
- 1.00 p.m. Get-Together Luncheon, Chevy Chase Room, Marlborough-Blenheim Hotel.
- 3.00 p.m. Ladies' Afternoon at Cards, Persian Garden, Convention Pier.
- 4.00 p.m. Obstacle Golf, Lawn of Marlborough-Blenheim Hotel.
- 8.30 p.m. Manufacturers' Amateur Vaudeville, Marine Hall, Convention Pier.
- 11.00 p.m. Informal Dancing, Ballroom, Convention Pier.

### The American Papers and Reports

The program of the American Association this year is a particularly attractive one. Practical experience has shown that the conduct of a mid-year meeting by the American Association has in no way diminished the interest in the annual convention. In fact, it has seemed to increase it by keeping active the interest of the members in association work. There has been no program for an annual convention of the association since its organization in 1905 which has been more replete with topics of present interest. Seven addresses are to be presented on topics which are live questions of the day, and those who are to speak on these matters at the convention are very conversant with the subjects which they will discuss. In addition, a number of important committee reports will be rendered. Among them are several which will probably arouse special interest, such as those on insurance and taxation and the report of the committee on determining the proper basis for rates and fares. As usual, the first meeting of the American Association is an open session. This session will be held this afternoon at the Greek Temple, and all are invited. As no other meeting of any association is scheduled for the same time, there should be a large attendance.

### Building Up Every-Day Business

Because there is always a temptation for the traffic department to expend a large part of its time and energy in promoting excursions and special traffic, the suggestions on building up steady every-day business contained in the report of the committee on passenger traffic are timely and to the point. The foundation of the successful operation of both city and interurban lines is a steady volume of traffic which can be provided for in advance and depended upon with certainty. The roads which derive a major part of their income from excursion business, extending over only a short season, as a rule are not money-makers. Their earnings are dependent on the vagaries of the weather and the caprices of a fickle public. Moreover, there is a twelve-months' investment charge during the year for a possibly three-months' income. Special traffic movements which require extra men and extra cars with the accompaniment of low rates are seldom profitable, and the chief reason why this class of business is sought after by many companies is that it is comparatively easy and cheap to get. The development of every-day business is slow work, and it often leads far from the confines of the traffic agent's office.

The committee on passenger traffic describes at some length in its report the growth of civic organizations in American cities and the results of their activities in building up communities. This is a line of work in which steam railroads have been especially active, and electric railways can profit by participation in it to an extent far greater than many realize. Analyses of street railway earnings in many of the larger cities in the United States show that the earnings increase approximately as the square of the population. The ratio of increase as applied to interurban lines is more complicated, but it is proper to say that any reasonable efforts expended toward increasing the population of the tributary territory of either an interurban road or a city system are usually repaid by a steady increase in traffic earnings.

### The Engineering Program This Year

Delegates to the convention this year will notice one change in the arrangement of the meetings over that followed last year and for several years. This change, as already stated in the *ELECTRIC RAILWAY JOURNAL*, is in the meetings of the Engineering Association. Last year this association held morning sessions on Tuesday, Wednesday and Friday and afternoon sessions on Monday, Tuesday, Wednesday and Friday. The change was based primarily upon the idea that under the conditions existing in Atlantic City, where the meeting hall is some distance away from even the nearest hotels, a recess for the mid-day meal would result in the waste of valuable time and that more work could be accomplished in one long session than in two short ones. We believe that the new plan is a wise one and that this fact will be reflected in a larger attendance than before. We think that the difference will be especially marked when compared with the afternoon meetings in former years. Heretofore all of Thursday has been assigned to an inspection of the exhibits, but they may now be inspected by the engineers on the afternoons of every day. The net result of the change is no diminution of the time to be devoted to discussions and an actual increase in the time available for inspection of the exhibits, because no time will be lost as in the past starting the afternoon sessions by waiting for the delegates' return from the different hotels.

### Convention Committee Reports

Several very desirable improvements have been introduced this year in the method of compiling the committee reports. Attention is directed to these features because it is believed that they mark a step forward in the methods available for obtaining the fullest value from committee work.

This year the roster of forty-seven committees contains the names of 325 individuals, and these committees have furnished excellent material which, in printed form, occupies more than 1075 pages and includes approximately 650,000 words. This is an increase of nearly 65 per cent over the total number of pages in the committee reports of last year. The work of preparing these reports for the printer and the supervision of their publication has been an immense task, which has been handled by Secretary Donecker in a most commendable way. The reports are notably free from typographical errors, and the subject-matter has been correlated and is presented in excellent form.

Features in the reports this year which it is expected will be much appreciated are the inclusion in some of bibliographies on the subjects discussed and the presentation at the beginning of the report of the roll call of each committee meeting or the vote of each committee member on the subjects considered. Thus, in the report of the joint committee on accounting will be found an extensive bibliography of books and of articles which have been published in the technical press and general magazines on the subject of efficiency engineering. Similarly the joint committee on block signals has in course of preparation a most elaborate index of articles on electric railway signaling. These indices and bibliographies represent a considerable amount of creditable research work on the part of the committee members, and the publication of the roll call of committee meetings shows to the associations at large how representative are the committee reports, and will give the association executives a basis on which to judge the seriousness of committee members.

The use of the letter ballot for approval or disapproval of recommendations of committees is new in the electric railway associations, but has been found to be acceptable by other large technical bodies. If the proposed rules of procedure for the work of the future standardization committee of the Engineering Association are accepted substantially in their present form that association will have considerable use for the letter ballot. Other associations

would do well to consider its adoption seriously, and particularly is this true of the Transportation & Traffic Association. The putting into general effect of codes of standard train rules for city and interurban operation is probably the most important operating question before any of the associations, and a more comprehensive means than a convention vote should be employed to determine the acceptance of a standard code of rules. The letter ballot probably is the best means available and will serve to secure the attention of those roads which ordinarily do not earnestly mix in convention work.

The city rules committee this year presents with its report a tabulation of the opinions of the member companies on the various rules, and a growing interest in association affairs is noted. Out of 294 companies operating city lines, the committee obtained responses from about 150 companies, which is a fairly good representation based on past letters of inquiry or data sheets sent out to the companies, but is not so large a number of replies as the importance of the subject of rules warrants.

The effectiveness of the Transportation & Traffic Association was increased this year by the advance work done by the executive committee. Previous to the announcement of the memberships of the committees which prepared the reports to be presented to this association the executive committee laid down certain plans of action along which each committee was instructed to work. The result was that at the first meeting of each committee actual work on the subject in hand was begun, while in former years it has been necessary for a committee to devote a good share of the first session to planning its work.

### The Exhibit

The phrase "Bigger, better, brighter than ever" may be a trite one, but it is applied with justice to this year's magnificent showing of electric railway materials. This exhibit is something more than a current record of progress in the electric railway industry, important as that may be. It is a proof of the broad-minded spirit of co-operation that annually animates the American manufacturers of electric railway apparatus to assemble such a display for the benefit of the industry at large. It is this spirit that has made the exhibit a really indispensable feature of every convention. From year to year the manufacturers have gladly spent larger and larger sums to make their displays more interesting and instructive. In former times most of the exhibits were confined merely to models or samples; to-day the makers of even the bulkiest equipment erect full-size operating outfits wherever possible. Only those who have visited the convention pier on the days immediately preceding the meetings can realize the task of erecting rapidly such comprehensive exhibits for the sake of a five day showing.

In this year's exhibit the track engineer will find everything in his field, from the most elaborate examples of special work to the smallest detail of bonding; the line engineer, from an installed catenary system to the test section of a tubular pole; the power engineer, from an erected boiler room furnace to the steam meter, and the car engineer, from the complete vehicle in operation to a piece of headlining. In short, the several branches of the industry are so well represented that every specialist must find much to interest him in his particular line.

The displays of improved electric control and braking apparatus, various types of signal systems, current checking instruments and fare collection devices are naturally in the foreground this year in view of the special interest which electric railway men are now taking in these matters. It is fortunate that the present convention pier is available for such a comprehensive exhibit, both because of its convenience and because of the familiarity of last year's delegates with the general arrangements.

## Conventionalities

Look out for Herman Piffletiff.

The rolling chair gathers no frost.

The cheerful, beneficent smile of Al Green is like oil upon the troubled waters.

The High water mark of salesmanship in the electric railway industry is conspicuous on the Boardwalk.

Uncle Charles Peirce and Cousin Jim Shaw, of New England, got into an altercation on the Boardwalk on Sunday morning because they hadn't seen each other for a long time.

Col. and Mrs. J. Harrison Steedman and Mrs. D. R. Calhoun were among the arrivals on the special train from St. Louis.

E. O. Ackerman, engineer, maintenance of way, Columbus Railway & Light Company, boarded the St. Louis special at Columbus and came through to Atlantic City.

M. M. Lloyd, master mechanic of the East St. Louis & Suburban Railroad, was a passenger on the special train from St. Louis.

No, Cuthbert. The red ribbons do not mean that this is a socialist convention, although the manufacturers modestly admit that they are strong believers in the Brotherhood of Man.

Those in attendance at the convention who are not associate members of the association should inquire of ex-President James F. Shaw, chairman of the committee on associate membership, or of any one of the members of this committee. They will learn something to their advantage.

G. H. Atkin this year attends the Railway Signal Association meeting at Colorado Springs. This is the first time in ten years that "the Admiral" has missed getting up a pool on the arriving time of the Chicago special train at the convention city.

After an absence of three years from the convention, the many friends of James H. Denton, formerly with the Allis-Chalmers Company, are glad to see him back again—this time in the capacity of representing his own firm, James H. Denton & Company, New York.

That no doubt now exists as to who has won the American League pennant is certain, because Messrs. F. W. Brooks, E. J. Burdick and A. D. B. Van Zandt felt safe last week in leaving Detroit and Michigan for a business trip East and for their regular attendance at the convention.

Thanks to the untiring efforts of Chairman McConnaughy of the exhibit committee, the Engineering Association has been provided with a satisfactory meeting hall which was made to order. The leather-bottom chairs will be appreciated by those members who come early and stay late.

The Public Service Railway not only has sent a large delegation of officers to the convention, but it has also contributed the services of Messrs. Gray, Du Bois, Glaccum, Boylan, Oelschlager, Kinlin and Cummerford, who are assisting at the registration desk of the American Association.

The first bride and groom to arrive at this convention were Bertram Berry and Mrs. Berry. Mrs. Berry has started her convention career right by becoming a full-fledged hand at exhibit work. She presides most gracefully over certain operations in the exhibit of the Heywood Brothers & Wakefield Company.

J. R. Ellicott, ex-president of the Manufacturers' Association, recently laid aside political burdens which he has borne

for a number of years. Ever since the organization of the village of Grand-View-on-Hudson, which nestles under the brows of the Palisades, Mr. Ellicott has been president of it. Last week he resigned the office, much to the regret and in spite of the protests and tears of his fellow citizens.

Chairman McConnaughy was laboring under grave apprehension on Sunday morning, because he was building a Turkish room in the exhibit of his company, the Dearborn Drug & Chemical Works, and the decorations were being hung by Italians. He very much feared that when the Italians awoke to the fact that the decorations were Turkish there would be trouble.

The Public Service Railway of New Jersey expects to have about fifty delegates present at different times throughout convention week. An advance guard composed of R. E. Danforth, general manager, N. W. Bolen, superintendent of transportation, and H. A. Benedict, mechanical engineer, were on the Pier Sunday to inspect the exhibits before the rush.

E. F. Schneider, manager of the Cleveland, Southwestern & Columbus Railway, coaxed Mrs. Schneider to come to the convention and she accepted on condition that she might be permitted to do a little sight-seeing. He promised and up to Sunday she had seen one big department store in Philadelphia, the Camden Ferry, 60 miles of New Jersey right-of-way and 10 miles of boardwalk.

The many friends of W. A. Dutton will be sorry to learn that he has resigned on account of ill health as secretary and treasurer of the Van Dorn & Dutton Company, Cleveland, Ohio, after 24 years' service. For the present Mr. Dutton will make his home in the South. His absence from this convention has led to many inquiries, as this is the first meeting that he has missed since his connection with the electric railway business.

The past-presidents of the American Electric Railway Manufacturers' Association are the recipients at this convention of congratulations over the handsome gold badges with which they have just been presented by the Manufacturers' Association. The badge consists of a name plate to which is attached a link bearing the dates during which the recipient served as president of the Manufacturers' Association, and appended to this link is a medallion. The latter is a base-relief showing Industry seated on an anvil and holding a blacksmith's hammer. Representations of a gear, an electric car and factory buildings give appropriate significance of the industry represented by the Manufacturers' Association. Those who have received badges of this kind in the order in which they have served are D. N. Brady, James H. McGraw and Joseph R. Ellicott.

W. L. Conwell, president of the Transportation Utilities Company, has not hitherto been looked upon as an amphibious automobilist, but from the experience he encountered on Saturday en route to Atlantic City he knows something of how an automobilist feels when he is in the water with his machine. Mr. Conwell, accompanied by J. J. Sinclair of the Westinghouse Electric & Manufacturing Company, W. S. Humes and T. Dunbar, Jr., of the Transportation Utilities Company, and Butler Keyes and W. R. Hamilton, of the Ellicon Company, had left Lakewood after luncheon and turned out to pass a vehicle coming from the opposite direction, when suddenly the road, which was sandy and soft, gave way beneath them. Mr. Conwell was at the steering wheel and in spite of his best endeavors the car went with the insecure road, toppled over and landed in the waters of Lake Carasaljo. Fortunately none of the occupants of the car was seriously injured. Mr. Conwell, the last member of the party to reach Atlantic City, came in Sunday afternoon and was the object of many hearty congratulations upon his fortunate escape.

## SOCIAL EVENTS TO-DAY

A varied program of entertainment has been provided for to-day. In the morning Leps' orchestra will give a concert in the lobby on the Pier. An afternoon of cards will amuse the ladies after luncheon, and in the evening the annual vaudeville performance will be given in Marine Hall on the Pier to be followed by informal dancing at 11 o'clock in the ballroom.

### MORNING CONCERT

The concert by Leps and his orchestra will begin at 11.30. A program of selections of modern composers has been arranged, including the following numbers:

- (1) Overture, "Raymond" .....Thomas
- (2) Waltz, "Tales from the Vienna Woods" ....Strauss
- (3) Fantaisie on Themes from "The Mikado". .Sullivan
- (4) March of the Toys, from "Babes in Toyland"

Herbert

- (5) Selections from "Lampa" .....Herold

### LADIES' CARD PARTY

The ladies' card party will be given in the Perstan Garden in the lobby on the Pier at 3.30. Players will have their choice of bridge whist, euchre and five hundred. Arrangements have been made for from 150 to 160 guests and as the prizes are very attractive it is hoped that at least that number of ladies will be tempted to take part. Eight prizes will be given for the eight highest scores for each game, and as the respective prizes for each game are exactly alike, the choice of games rather than of the prizes will determine each player's selection for the afternoon. Progression will be followed in all games and all the rules of each game will be printed on the score cards. In order to facilitate the play and progression opponents will record each other's scores instead of having the scores punched by members of the committee in charge as in previous years. The tables will be covered with white linen, and bonbons and light refreshments will be provided.

### VAUDEVILLE PERFORMANCE

At 8.30 in the evening the annual Manufacturers' amateur vaudeville will be given in Marine Hall on the Pier. In accordance with the plan adopted this year of holding all of the convention entertainments on the Pier a complete theatre equipment with stage, footlights, drop curtain, scenery and all other accessories has been installed in Marine Hall especially for this one performance. An exceptionally clever and talented aggregation of amateur talent has been secured, including the University of Pennsylvania Glee Club, by the courtesy of the U. S. Metal & Manufacturing Company; the University of Pennsylvania Mandolin Club, by courtesy of the Allis-Chalmers Company, and the University of Pennsylvania Banjo Club, by courtesy of the Westinghouse Companies. These clubs will give three of the numbers on the program. E. F. Wickwire, of the Ohio Brass Company, who rendered that touching ballad "He Must Feel Funny Inside" at the vaudeville show last year, has consented to give an imitation of himself in the part of a Dutchman talking to his shadow. Obadiah Oatcake, impersonated by Ernest Wright through the courtesy of the Galena-Signal Oil Company, will talk about "An Up-State Delegate." The General Electric stars, A. L. Atkinson and J. P. Thompson, have carefully rehearsed a sketch entitled "Sons of Rest" for the occasion. Instrumental music will be furnished by Lep's orchestra and vocal music by the Pre-payment Car Sales Company's "Nickel-Pickers' Quartet."

Come early and wear your badge.

## BUREAU OF RAILWAY INFORMATION

George E. Armstrong, manager American Railway Guide Company, has established a bureau of railway information at the right hand of the stairway in the main lobby. The exact location is known as space 10, and here Mr. Arm-

strong is prepared to answer all inquiries regarding steam railway train service to any part of the country and to make parlor car and Pullman car reservations for the homeward trip of any or all convention delegates. These courtesies are extended gratuitously by Mr. Armstrong and the company which he represents.

## RECEPTION TO ASSOCIATION OFFICERS

The annual reception to the officers of the American Electric Railway Association and affiliated associations was held in the ballroom on the Convention Pier last evening. It was the real opening of the social side of the convention, although all day long new arrivals were greeting old friends as they came to the Pier to register. At 9 o'clock the orchestra under the leadership of Wassili Leps began a musical program which entertained the guests as they were arriving. Miss Charlotte Guernsey, dramatic soprano of the Philadelphia-Chicago Opera Company, was the soloist and rendered selections from "Faust" and "La Tosca." While the orchestra was playing the officers of the different associations and their wives were assembling in the booths around the hall. The officers of the American and Manufacturers' Association assembled in the adjoining booths of the Dearborn Drug & Chemical Company and The J. G. Brill Company, the Engineering Association officers in the booth of the Pennsylvania Steel Company, the Transportation & Traffic Association officers in the booth of William Wharton, Jr., & Company and the Accountants' and Claim Agents' Association officers in the booth of the General Electric Company.

Promptly at 10 o'clock the officers and their wives were escorted to their positions in the receiving line where they greeted the large assemblage of guests. Those in the receiving line included A. W. Brady and Mrs. Brady, T. N. McCarter, Gen. Geo. H. Harries and Mrs. Harries, H. C. Donecker and Mrs. Donecker, W. H. Forse, Jr., and Mrs. Forse, H. E. Weeks and Mrs. Weeks, W. J. Harvie and Mrs. Harvie, E. O. Akarman, Martin Schreiber, Norman Litchfield, E. J. Burdick, C. B. Voynow, H. V. Drown and Mrs. Drown, H. K. Bennett and Mrs. Bennett, C. A. Avant and Mrs. Avant, B. B. Davis, James R. Pratt, M. Spillane and Mrs. Spillane, H. C. Page and Mrs. Page, J. N. Shannahan and Mrs. Shannahan, C. D. Emmons, J. V. Sullivan, Charles C. Castle and Mrs. Castle, Cornell S. Hawley, Edwin H. Baker, H. C. Evans, Scott H. Blewett and Mrs. Blewett, J. R. Elliott, A. H. Sisson, H. C. Ebert, W. H. Heulings, Jr., and Mrs. Heulings, J. W. Porter and Mrs. Porter, and James H. McGraw.

At 10.30 informal dancing began.

## ROLLER CHAIRS

The free use of roller chairs will be extended to all wearers of the official convention badge. The chairs will be stationed at the Convention Pier, Marlborough-Blenheim and Chalfonte Hotels, for use between the hours of 9 a. m. and 7 p. m., October 10 to 13, inclusive, and from 8 p. m. to 10 p. m. between hotels and the Pier only on Tuesday and Thursday evenings. Any keed or Shill chairs may be had after these hours for direct runs from the Convention Pier to hotels at a nominal charge of 25 cents per person. In order to relieve the members of the chair committee from the arduous labors of previous years, five men, furnished by the chair owners, have been employed to look after loading the chairs at the Chalfonte, the Marlborough-Blenheim and the Pier. These men will be on duty at all times and will hear all complaints and report to the chairman of the committee. The men will wear the black and red ribbon of the entertainment committee for identification.

### THE ST. LOUIS SPECIAL TRAIN

The special train from St. Louis which left there at 12:25 p. m. Saturday arrived at Atlantic City at 3 p. m. Sunday. The trip was pleasant and without special event, the train carrying in all ninety passengers. The service was excellent all the way through. Arthur S. Partridge, as master of transportation for the association, looked out for the comfort and convenience of passengers in his usual highly capable manner, and the train was in charge of C. C. Curtice, district passenger agent of the Pennsylvania Railroad Company at St. Louis. The train steadily accumulated additional passengers at Terre Haute, Indianapolis, Columbus, Dayton and other stations. Among the passengers were Arthur W. Brady, president Indiana Union Traction Company and president of the American Electric Railway Association; Mrs. Brady and Masters George W. and Arthur A. Brady; Richard McCulloch, of the United Railways Company of St. Louis, which company was also represented by Bruce Cameron and J. E. Burgess, with Mrs. Burgess; M. O'Brien and Mrs. O'Brien; James G. Robertson and Mrs. Robertson. Other passengers were C. E. Morgan, general manager Indianapolis, Crawfordsville & Western Traction Company; T. F. Grover, general manager Terre Haute, Indianapolis & Eastern Traction Company, and Mrs. Grover; Scott S. Crane, general manager Altoona & Logan Valley Traction Company, and Mrs. Crane; E. J. Pratt, general superintendent and purchasing agent Southwest Missouri Railway Company; C. T. Hewitt, superintendent East St. Louis & Suburban Railway, and Mrs. Hewitt, and a number of manufacturers, among whom were S. W. Crawford, of the Moore-Jones Brass & Metal Company, and Mrs. Crawford; James Paton, of the National Brake & Electric Company; Nic LeGrand, of the St. Louis Car Company, and Harold J. Wrape, of the American Carbon & Battery Company. Outside of the dining car the chief method of recreation on the train seemed to be found in games of cards. Several of the ladies on the train, discovering a few gentlemen engaged in a card game in which men are presumed to be particularly skilful, challenged the gentlemen to a trial of skill with some real money as forfeits, and the best information indicates that all of the gentlemen lost. The trip was voted by everybody on the train an eminent success.

### TRAMWAYS AND THE "COMMON GOOD" IN GREAT BRITAIN

The practice of charging the surplus or deficit made by the municipal tramway systems in Great Britain to the "Common Good" is sometimes misunderstood in America, where the "Common Good" is supposed to be synonymous with the city treasury. A paper presented at the meeting of the Municipal Tramways Association in Glasgow, Sept. 27-29, by Walter Nelson, sub-convenor of the Glasgow Corporation Tramways committee, gives a history of the "Common Good" in Glasgow and shows the wide distinction between that fund and other property or funds of the city. The "Common Good" in Glasgow dates from the twelfth century and seems to have had its origin in the lands owned then by the community. The money received from sales or rentals of this real estate was credited to the account, and the expenditures have included the maintenance of the buildings on this property and the salaries of certain city or burgh officials.

At present all of the city churches, nine in number, and their sites, with the exception of the Glasgow Cathedral, are the property of the city and form part of the assets of the "Common Good." The pew rents are credited to this fund and the fund is responsible for the church expenses. Last year the expenditures for these churches exceeded the receipts by about \$20,000. The "Common Good" also defrays a certain proportion of the school and law expenses

and other city charges. The chief asset of the "Common Good" in Glasgow at present is the tramway system, whose surplus is paid to its treasury. Up to last year no funds either from the tramways department or from other income received from the "Common Good" were used directly for the relief of taxes in Glasgow. Last year the Town Council decided to defray from the fund the park tax, amounting to 2d. per £1, and paid to the park department about £44,000. This year a motion to repeat this payment was defeated and the 2d. park tax has been re-imposed.

### A CONTRIBUTION TO THE CONSCIENCE FUND

The following letter from a conscience-stricken ex-conductor was received recently by George H. Lyne, superintendent Henderson (Ky.) Traction Company:

"Indianapolis, Ind.

"Sep. 5. 1911.

"Mr. George Lynn

"Dear Sir: I don't know whether or not you remember me when I run on your cars a short while last Autumn was a year ago. But that does not matter whether or no I know I let some of my friends ride one night without paying for their ride. I never come out and nock down or stoled any of your change that I knew anything about but I borrowed something like 40 or 50c one time in making some change but aim to put every coper back in the box. So I will send you 30c. I am shure that will cover all expenses. Ther is coming a great judgement day when ever thing will be made known whether we think so or not if the Bible be true. Are you getting ready for that time? That is the reason I am sending this small amount of change. I never call myself stealing the money or nothing like that. I had plenty of chance to have nock down several rides as to that matter, but I guess it was something about as mean to let my friends ride without paying. I shure God was not pleased with that way of doing are the Lord would not have brought it up before me and condemed me about the mater. It means more than most people think to be a christian. I hop you will think about that if you have not Where will you spen eternity.

"Yours truly,

"Postscript.

"Man looketh at the outward apperance but God looketh on the Heart. I know that was not according to your rules to let my friends ride or to borrow any of your money at any time if I was short on financial affairs. Pardon me for not settling sooner."

### SOCIAL GATHERING OF THE CLAIM AGENTS

The "get-together" meeting of the Claim Agents' Association was held at the Traymore Hotel at 2 o'clock on Monday afternoon. About fifty members were in attendance. President Drown made a short address in which he pointed out the benefits of good fellowship at the convention. He also assigned a number of veteran attendante to guide the new members. James R. Pratt, assistant general manager United Railways & Electric Company of Baltimore, gave a brief talk on the desirability of having the parent association install a general publicity bureau at the association headquarters to gather and disseminate data on the prevention of accidents to the general public, school children and employees, particularly with a view toward helping the railways to install accident-prevention equipment.

Charles B. Hardin, claim agent United Railways of St. Louis, was heartily in accord with Mr. Pratt's suggestions. H. K. Bennett, claim agent Fitchburg & Leominster Street Railway, also favored them, incidentally mentioning the beneficial results of educating the public and employees as obtained on his own system. President Drown requested prompt attendance at the convention meetings.

## THE BADGES THIS YEAR

The design selected for the badges this year suggests, like those of last year, the atmosphere of the sea. At the center is an American shield on which are superimposed the flags of Canada and Mexico, typifying the international character of the membership of the association. On each side of the shield are two mermaids and at the top of the badge is a front-end view of an electric car. The lettering on the badge carries the new name of the association, American Electric Railway Association, for the first time.

The colors of the ribbons attached to the badge are the same as last year. For the convenience of those who are attending the convention this year for the first time, and for others who have forgotten exactly the significance of the different colors, their meaning will be published. Delegates to the American Association wear marine blue; Accountants' Association, orange; Engineering Association, brown; Claim Agents' Association, green; Transportation & Traffic Association, gray; Manufacturers' Association, red; guests, light blue; ladies, white; associate members, purple; members of finance, entertainment and exhibit committees of the Manufacturers' Association, dark blue and red stripe.

The numbers on the badges correspond to numbers which are printed in the list of delegates in attendance at the convention. Three lists will be published, each showing the registration to the date on which the list goes to press. The first list went to press last night and will be available this morning at the secretary's office, at the hotels and at the booth of the *ELECTRIC RAILWAY JOURNAL*. The second will contain the registration up to to-night and will be distributed in Atlantic City at the same places to-morrow morning. The third list will contain the registration up to Thursday night and will be available Friday morning.

## THE CHICAGO SPECIAL

The Chicago Pennsylvania special arrived at Atlantic City about 10.30 yesterday morning after a very pleasant trip. This train, which left Chicago at 12 o'clock noon Sunday, consisted of nine sleeping cars, two diners, a buffet parlor car, a parlor observation car, a baggage car and two large locomotives. It came through on time at each scheduled point, and the accommodations were excellent in every detail. E. K. Bixby had personal supervision of the train.

There were 160 passengers on the train. Of this number about thirty were ladies and fifty were operating railway men from points as far west as Kansas City and Salt Lake City. During the trip frequent comments were made regarding the representative personnel, which included many of the presidents, general managers and heads of departments of the leading railways of the Central Western States. The entertainment committee chairman, A. H. Sisson, aided in making everyone comfortable en route. Through the courtesy of Lyon & Healy, Chicago, a victrola was furnished with a selected list of records. This was placed in the observation car, where continuous musicales were held.

The exciting event of the trip was the pool made on the time the train would cross the Delaware River. The first prize, \$50, was won by W. C. Sparks; second prize, \$30, by George Kippenberger; third prize, \$20, by S. P. McGough; fourth prize, \$7, by T. E. Rust; booby prize, \$2, by A. H. Sisson.

## YESTERDAY'S CONCERTS

The concerts given yesterday morning and afternoon in the lobby of the Convention Pier by the symphony orchestra of Wassili Leps were a delightful feature of the opening day. This organization of talented musicians has been engaged for the entire week by the entertainment committee and

will furnish the music at all of the social affairs of the convention. The numbers on the morning program included Mendelssohn's "Spring Song" and selections from Verdi's "Il Trovatore." In the afternoon the fantasia from "Faust" and the "Beautiful Blue Danube" waltz were generously applauded by the appreciative audience. The lobby promises to be the most popular spot on the Pier during the hours when the orchestra is playing.

## GENERAL HARRIES RESIGNS FROM THE WASHINGTON RAILWAY & ELECTRIC COMPANY

Gen. George H. Harries, vice-president and general manager of the Washington Railway & Electric Company, Washington, D. C., and second vice-president of the American Electric Railway Association, will resign his position with the Washington company to become connected with H. M. Bylesby & Company, Chicago, Ill., engineers and managers of public utilities. He will reside in Chicago. General Harries



Gen. George H. Harries.

is a national figure in the electric railway and lighting field and has always taken a great interest in association matters. He is a native of Wales, but he has served his adopted country well and long. While yet a lad he toured the Canadian Northwest and spent many active years on the plains and in the mining regions. His Western life made him so familiar with the traits of the Indians that President Harrison appointed him a member of the Sioux Commission in 1891.

Before the late Spanish war General Harries was commissioned by President McKinley to the command of the brigade of the National Guard at Washington, and during the war he was in command of a regiment of infantry from the District of Columbia. He still takes an active interest and part in the work of the regular army and for a number of years has had charge in the War Department of the military defenses of Washington.

General Harries' first connection of note with the railway industry was as president of the Metropolitan Railroad, Washington, to which office he was elected in 1896. Returning from the Spanish war, he devoted his attention to lighting and traction work, and in January, 1900, became a member of the board of directors of the newly organized Washington Traction Company, a tentative aggregation of railway and electric light corporations. Six months later he became vice-president of the organization now known as the Washington Railway & Electric Company, which controls the Potomac Electric Power Company, the Great Falls Power Company and the street railway systems in Washington. General Harries, besides being second vice-president of the American Electric Railway Association, is chairman of its federal relations committee and a member of its public relations committee. He is also treasurer of the National Electric Light Association, and last month was elected president of the Association of Edison Illuminating Companies, of which for the past two years he has been vice-president. In addition, General Harries has been a member of the Washington Board of Trade for the past two years and was vice-president of that body for one year. He is also a member of the Washington Society of Engineers and the Illuminating Engineering Society and an associate member of the American Institute of Electrical Engineers.

## ADDRESS OF PRESIDENT HARVIE OF THE ENGINEERING ASSOCIATION

It is a very great pleasure indeed to be privileged to preside at a series of meetings which give promise of so much benefit as these composing our ninth convention. We are happy to welcome our friends both in this and in the allied associations, and we are especially glad to extend this welcome to those who have recently become interested in our work and who have come here to assist us in it.

While this meeting was originally intended to convene in the Middle West, yet I do not find that the value of this year's work has been lessened by the necessity of again meeting in the East.

We separated last year with a large amount of work before us, and your executive committee found itself confronted with the old problem of too much work for the time available and number of committees at hand, only in a more exaggerated form than ever before. Several ways and means were discussed, all of which called for more time and more committees, or less work. As a partial solution the work for the year was laid out promptly, the number of committee members on standing committees was increased from six to nine, and several special committees were appointed. From this point on the work was in the hands of the various committees, and the advance papers leave no doubt as to the results accomplished by our committees.

Among the subjects treated this year are several important ones which have been very thoroughly threshed out and which are laid before you in definite and complete form. Such treatment as these particular subjects have received at the hands of the committees is exactly what should be accomplished by an association such as this, and we cannot but feel that some concrete good has come from a study which has for its result practical and workable recommendations.

The excellent treatment of the subject of block signaling for electric railway service cannot fail to appeal to you as a thorough study of a subject which is just now uppermost in the thought of those identified with high-speed electric railway operation. The close relations which have existed between this association and the other allied associations have this year been further developed by the work of this joint committee, which has done exhaustive work in conjunction with the Transportation & Traffic Association. Many of the subjects which should be taken up by any one of our allied associations require representation from some other association, in order to receive the breadth of study required, and it augurs well for the future of all the associations that this inter-relation is growing noticeably closer and more co-operative each year.

The "Question Box" is a problem which will come before you for action. Many of our members felt that its usefulness in its present form was diminishing, and on sending out inquiries it developed that less than half of our membership desired to have it discontinued, but a large portion were in favor of retaining it and making it better. In an endeavor to accomplish this a "Question Box" committee of three members was appointed to undertake an improvement. The "Question Box" has long since passed the point of being a one-man proposition, and a free discussion and an expression from you as to its status would, I am sure, be appreciated.

Another matter which should be thoroughly discussed and settled at this meeting is that of the rules of procedure for adopting standards, which you have before you. It was intended that this committee should develop a systematic method of handling standardization work, in order to assist your executive committee this year. The importance of its report, however, led us to decide to give it the publicity which would come from presenting it on the floor for discussion and approval.

There are two matters to which I wish especially to call your attention. One is the matter of standards, which has been touched upon by each of our presidents since the old standardization committee was formed. We have succeeded this year in putting those recommendations of our committee on standards which have been approved in convention before the American Association for final approval in the manner in which your executive committee was instructed at the last convention, namely, in letter ballot form. These ballots were sent out through the secretary of the American Association, asking for the signature of the executive official of each company on the letter ballot. This plan, in connection with our method in this association, reduces to a minimum the opportunity for criticism with regard to a too hasty adoption of standards or recommended practice, which it is always necessary to guard against in an association like ours. By comparison with the usual number of replies received in answer to questions sent out, the number of ballots cast was very satisfactory, although many companies did not vote at all. However, this is a most important matter and another year should result in a much larger number of ballots cast.

We should remember that we, as engineers, have a duty to perform in this matter, and while we must realize that all apparatus and methods cannot be standardized, yet a great many can be standardized to the ultimate advantage of the railway companies. Those standards which it is possible to use economically we should use our best endeavor to have adopted in each of our respective departments, or we had best discontinue our investigations.

A matter which seems to me to be a very important one is the institution this year of work jointly with technical associations other than those covering the electric railway field, notably the American Society for Testing Materials, the American Railway Engineering Association and the National Electric Light Association, with all of which we have interests in common in some branch of our work. Our committees have worked this year in conjunction with committees of each of the above mentioned societies, and we have, I believe, profited by the interchange of ideas. The co-operative spirit we are meeting on every hand is very gratifying and will be mutually beneficial also, to the same degree that it is co-operative. The value of the broader viewpoint to be obtained by the joint investigation of subjects which are of mutual interest can hardly be over-estimated.

I have drawn your attention to a few of the most important things that the association has had before it this year, and I want to impress upon you at this time the fact that the field of work opening before us is increasing so rapidly in scope that our largest problem is how to keep far enough in the lead to have our association of value to its members. The electric railway industry is becoming constantly more and more diversified, and we must be even more active and more progressive accordingly. Your officers and executive committee have endeavored to expend their efforts in making the work of the 1911 convention add its proper portion of progress, but there is need of still more systematic progress in order that the Engineering Association may be properly representative of a business which has shown such remarkable growth and which has come to be so important a factor in our communities.

I could not close these remarks without calling attention to the hearty co-operation and effective effort displayed on the part of the working committees. Thirteen committees have been working, and on these committees sixty-five engineers have served, all of them whole-heartedly. These committees have produced for our use some 600 pages of valuable material, or nearly twice the amount produced last year. It is fitting, I think, that I extend to these gentlemen at this time, on behalf of your executive committee, as well as of the association at large, our appreciation of their activities. The members of these committees are all busy men, and the result of this year's work indicates clearly that

a very considerable amount of energy and time has been given by our committee members in order that we may profit by their efforts and that this association may be the clearing house, as it were, through which the electric railway industry may reach its fullest development.

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## ADDRESS OF PRESIDENT PAGE OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

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The Transportation & Traffic Association is a young child, yet I feel that it has shown strength and character that will put the association in the front ranks of the associations affiliated with the American Electric Railway Association.

The association started its work early this year. The executive committee meeting was held in November, and the make-up of the committees was entirely completed at that time. I desire to emphasize the desirability of keeping to this standard, inasmuch as it affords the committees several additional months in which to carry on the work assigned.

This year there was appointed a new committee on freight and express accounting jointly with the Accountants' Association, and a committee on block signaling jointly with the Engineering Association. The close relationship between affiliated associations which joint committees of this kind bring about is invaluable, and undoubtedly many matters will come up in the future which will require joint action of this kind.

Following out instructions of the convention, the executive committee this year adopted the plan of rather definitely fixing the lines of investigation for the different committees. This is important and exceedingly helpful to the committees, inasmuch as it gives these committees bases upon which to start their work. The work done by the different committees has been very thorough.

The signal committee has developed its subject in an elementary way and brought it up to date. The necessity for this is obvious, as it is a comparatively new subject for electric railway operators. The labors of the committee are well worth the thanks of everybody engaged in electric railway work.

The committee on interurban rules has spent a large amount of time in getting up these rules. The fact that its members represent operating conditions from coast to coast, and that the report made by the committee is the consensus of opinion of the combined membership of the committee, is important. There is no doubt that the fact that they feel that the amended code is one that will fit itself to the conditions prevailing on a large majority of the railroads justifies the support of the operating properties of the country. The Street Railway Association of the State of New York has unanimously approved the report of the interurban rules committee this year.

The committee on city rules has developed a most complete report, and I trust that the members will discuss this report fully. I wish at this time personally to compliment the committee on the very complete and intelligent work that it has done.

The schedules and time-table committee has developed studies of conditions prevailing on interurban lines, and submits recommendations for the construction of working time-tables, one of the most important elements in economical operation and a safety factor in this branch of railway work. The definitions given in the report should do much to establish consistency in the use of the various terms peculiar to our business.

The committee on fares and transfers last year submitted a very valuable report. There was not time, however, to give it the discussion which it deserved. The committee this year, in addition to giving to our members a study of practice with regard to the general subject of fare collection and registration, is anxious that the definite recommenda-

tions proposed in 1910 be taken up and criticised. The work of this committee was extended during the present year to include subjects relating to all kinds of fares. Heretofore the topics treated have been those relating to transfers only. One of the matters discussed by the committee in the report to this convention is that of interurban practice. This has not up to this time been touched upon by our association, and it certainly should develop discussion of much value to those interested in interurban lines.

The conclusions and recommendations of the committee on express and freight traffic, and also the tabulations submitted, should be studied carefully and free discussion developed. Undoubtedly there are great possibilities for the future, but it is important that our members be fully informed and in position to take advantage of early experiences so as to guard against mistakes. Naturally, the companies should be in a position to know whether the business is being conducted without loss. It is to provide proper means of doing this that the joint committee on express and freight accounting was appointed this year. The report submitted should have your careful consideration.

The committee on passenger traffic presents a report touching, among other things, upon the development of civic organizations. This was suggested at the last convention as a topic that might be investigated with profit to the members. The development brings out much interesting information as to the part taken by electric railways in civic advancement.

We have also been favored this year with a paper on multiple-unit operation. The increasing service on city lines and movement in congested districts makes this subject one of most timely interest. The paper, with the discussion which has been arranged for, should give to those present much information of considerable value, not alone from the operating standpoint, but as regards the mechanical difficulties in the development of train operation on city lines.

I wish to extend a welcome to associate members of the Transportation & Traffic Association, and invite you to enter freely into the discussions. Operating men by becoming members and telling the electric railway side of the story can do much in the development of our business. I trust and hope that the Transportation & Traffic Association will soon show as large an associate membership as our affiliated Engineering Association.

I wish to thank the member companies for their co-operation in furnishing data and permitting committee members to devote so much time to the work.

The Manufacturers' Association have gathered together a wonderful exhibit, and I trust the delegates will devote as much time as possible to inspecting the new devices shown.

I urge the delegates to be prompt in attending all of the meetings, and to come prepared to discuss the various papers and matters presented. On Tuesday afternoon at 2 o'clock the American Association will have an open meeting at which all members are invited to be present.

The Transportation & Traffic Association represents one of the most important branches of the industry, and we, as operating men, are duty bound to give the association our very best efforts. While, as a rule, we are very busy, we certainly should devote some time to the good of the cause, and especially at the convention. We should attend the meetings and enter into the discussions.

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The Evansville, Henderson & Owensburg Traction Company plans to ferry its cars across the Ohio River en route from Evansville, Ind., to Henderson, Ky. The ferryboat which will be used will be 130 ft. long with twin screws and engines of 120 hp. It will carry two 50-ft. interurban cars across the Ohio River, which is 1600 ft. wide, in five minutes. Sliding cradles will be constructed so as to permit the cars to be run on and off the ferryboat at any stage of the river.



**REPORT OF THE SECRETARY-TREASURER OF THE  
TRANSPORTATION & TRAFFIC ASSOCIATION**

In submitting his report your secretary-treasurer will touch briefly upon a few items of interest and show particularly a statement of expenditures during the year just closed.

It will be noticed that a considerable increase is shown in operating expenses, which is mainly attributable to the formation of new committees, namely, the joint committee on

fact that a large percentage of committee meetings have been held in the headquarters office. Where the make-up of the committees, from the standpoint of geography will permit it seems highly desirable that the facilities of the main office be utilized in this way.

Your secretary would also call attention to the increase in the number of pages of printed matter. Last year your association distributed in advance 154 pages in the form of committee reports and papers. This year the total shows 254 pages without considering the material in the reports of the joint committees on block signals and express and freight accounting; adding this material would make a grand total of 360 pages, or adding one half of the pages in these two last-mentioned reports as perhaps the number which should be credited to this association, we have a total of about 300 pages.

A matter which is of growing importance is the likelihood that some further procedure beyond a *viva voce* vote at the conventions is desirable in the adoption of standards or recommended practice of this association. It might be advisable to appoint a committee to go into this matter. The Engineering Association has this year adopted a plan by which the American Association, after the recommendations have been favorably passed upon at the convention, submits these recommendations to member companies by letter ballot, thus affording every member company an opportunity to express its approval or otherwise of such recommendations as annual conventions may make. The desirability of obtaining the sentiment of the largest possible proportion of the membership with regard to matters of this kind is obvious.

Another subject that is constantly referred to, and justly so because of its importance in the proper development of the work of your association, is the necessity for full discussion of reports and papers presented here. It is needless to call attention to the fact that the value of the time and energy expended by committee members and others in the preparation of the material which is put before you can never be fully realized without a free expression of thought at these annual meetings. The opportunity to do this is not afforded elsewhere, and it is to be hoped that each one of the delegates present will consider it his personal duty to assist in bringing out the many phases of the different subjects taken up by the busy men who have conscientiously devoted their valuable time to committee work.

There is another matter to which the secretary desires to direct attention, that is the importance of the data sheets and inquiry forms sent out from time to time throughout the year. Sometimes the work along this line may be subjected to adverse criticism. It is, nevertheless, true that these inquiries are necessary essentials to the proper advancement of association work. The forms are made up with a view to requiring the minimum of time to answer, and it is hard to see how the committees can show results unless the data called for are freely given. In addition new committees will undoubtedly be made up from year to year, and, while these may have the benefit of previous investigations, there will be many points upon which enlightenment will be required and which it will be necessary to ask the members to provide. We bespeak for these communications such attention as can be consistently given, keeping in mind that the data are required by operating men appointed to serve your interests by the executive committee of your association and definitely instructed to work along certain lines. Your secretary does not desire that this be construed as a criticism, but merely as an explanation of the facts which make such inquiries necessary and which our busy members in the press of work more immediately important are apt to overlook.

You will recall that at the 1910 convention of the American Association a new plan of associate membership was approved. This made it necessary for these individual members to ally themselves with one of four associations,

GEOGRAPHICAL DISTRIBUTION OF COMMITTEEMEN	
Alabama	1
Arkansas	1
California	1
Colorado	1
Connecticut	1
Dist. of Columbia	1
Illinois	7
Indiana	4
Iowa	1
Maine	1
Maryland	1
Massachusetts	6
Missouri	3
New Jersey	4
New York	9
Ohio	4
Oregon	1
Pennsylvania	1
Texas	1
Virginia	2
Washington	1
West Virginia	1
Canada	1
Total	57

block signals for electric railways and the joint committee on express and freight accounting, to the increased number of committee meetings held during the year and the greater period of time consumed by such meetings. There is no question however, that due diligence has been exercised by all concerned to keep these expenses at a minimum consistent with the proper development of the work in hand, and in considering the matter we should bear in mind the geographical location of the members of the various committees and the necessary time and expense in going to and from convenient meeting points.

With regard to the geographical distribution of committee membership it is interesting to note that the membership is in keeping with the geographical distribution of member companies. It is important that this be maintained and the Transportation & Traffic Association is to be congratulated that it has been able to work out the committee membership

EXPENSES FOR THE FISCAL YEAR ENDED SEPT. 30, 1911	
Executive committee	\$392.24
Committee on interurban rules	668.03
Committee on express and freight traffic	173.70
Committee on city rules	18.16
Committee on passenger traffic	156.60
Committee on training of transportation employees	74.23
Committee on construction of schedules and timetables	266.94
Committee on fares and transfers	28.20
Joint committee on block signaling for electric railways	62.05
Joint committee on express and freight accounting	78.77
Proceedings	2,135.63
Miscellaneous	25.45
Total	\$4,080.00

so advantageously. It has much to do with obtaining the best results and the working out of recommendations of standard methods, practice and plans that will comprehend the industry as a whole.

When possible, your secretary has endeavored to attend the meetings of the different committees. This would appear to be desirable in order that the association headquarters may be in position to render all assistance within its power. In the compilation of data and in research work the headquarters can often save considerable time to the committee members, and it is also likely that in many cases data useful to the committees are already on file. If the secretary is present at the meetings he can in such cases inform the committeemen to this effect, and if the meetings are held in the headquarters office, the information is, of course, immediately available. It is also well to call attention to the

namely the American, the Engineering, the Claim Agents' or the Transportation & Traffic Association. It is a pleasure to note that during the past year there have been placed upon the rolls as associate members of the Transportation & Traffic Association 175 individuals. Those connected with the transportation, passenger, freight and express, advertising, publicity and other departments of electric railway companies, as well as those gentlemen interested in the operating branches of the business, though not directly connected with electric railway companies, may ally themselves with our association as associate members. New plans for the special benefit of associates will be instituted from time to time by the American Association, but the development of such plans will naturally come only as rapidly as the increased membership will warrant. We have an exceedingly good start this year, but with the field we have to draw upon it seems that there should be as large an individual membership in this association as is enrolled in our affiliated Engineering Association, which to-day has a membership of approximately 850.

As another matter of interest to the members, it might be mentioned here that the association will as soon as possible after the convention issue an index of the proceedings of your association. This will describe in a brief way the main features of committee reports and discussions of each of our annual conventions, and should serve as a book of reference and be helpful in affording an opportunity to acquire ready information upon the many subjects taken up. Information frequently is requested which has already been given in the proceedings in considerable detail, and an index of the kind referred to by summarizing these data would often save considerable time to our member companies and in some degree promote a more general acceptance of the recommendations approved by your organization.

## OPENING SESSION OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

The first session of the 1911 convention of the Transportation & Traffic Association was held yesterday afternoon at the Greek Temple. President Page presided. In opening the meeting the president announced that the first business on the program was the presentation of his annual address. This is published on another page.

Secretary Donecker then presented the report of the executive committee, which consisted of the minutes of the meetings of the committee. He then read his report as secretary and treasurer of the association. This report is published elsewhere in this issue.

J. N. Shannahan, New York, said that he thought it proper to call the attention of the members to the splendid work done by the secretary. The results obtained by the association were due in no small degree to the hard and constant efforts of the secretary and he moved that the association should express its appreciation of the secretary's efforts. The motion was seconded by N. W. Bolen, Newark, N. J., and passed unanimously.

Secretary Donecker expressed his appreciation for the vote in a few words in which he said that he had tried to do the best he could, and if it was satisfactory to the association he was well pleased.

Upon motion, the report of the executive committee and of the secretary and treasurer were accepted by the association.

President Page then announced the appointment of a committee on resolutions. It consisted of E. F. Schneider, J. J. Johnson and J. Stanley Moore.

J. N. Shannahan in behalf of the committee on subjects then read the report of that committee. It stated that as there were nine reports of standing committees to be considered at this convention the committee had thought it

best to reduce somewhat the number of papers to be read. The report was accepted and ordered placed on file.

### TRAINING OF EMPLOYEES

President Page announced that the committee on the training of employees had been unable to prepare a report of the convention, but he would ask for a discussion on the subject.

C. E. Learned, Boston Elevated Railway, at the request of President Page then presented some very interesting employment statistics of the Boston Elevated Railway showing in detail for the fiscal year ended June 30, 1911, the following: number of men who applied for positions in the train service, number rejected on sight, men who failed in physical examination, men who failed because their references were unsatisfactory, men disqualified temporarily because of physical examination, percentage of resignations during the year, percentage of men discharged during the year, etc. He stated that the company had among its motormen and conductors about 160 who were especially assigned to break in new men. These men receive 10 cents per day for this service in addition to their regular wages. About four weeks are required to break in a man and the cost to the company is between \$25 to \$30 per man to provide this instruction. Mr. Learned then read the following letter form which is sent to each man as soon as he is accepted in service by the Boston Elevated Railway.

#### LETTER OF ADVICE TO NEWLY APPOINTED CONDUCTORS AND MOTORMEN IN BOSTON

"You are entering upon a public service in which it is necessary to be punctual, civil, diligent and loyal.

"Punctual, that cars may be started and run at regular times known to the public.

"Civil, that the service may be made attractive, patronage encouraged, and cause for complaint avoided.

"Diligent, that your own interests may be protected and you may be qualified for advancement and that the company may find you reliable and ready for work.

"Loyal, that you may make a correct and honest return of all money received, and that you may be careful and zealous to protect the company's property and interests, and take a just pride in the service in which you are engaged.

"You must bear in mind that in a public service you are constantly called upon to exercise great patience, forbearance and self-control. Politeness and courtesy will be required of all employees in their dealings with the public.

"Conductors and motormen are representatives of the company. In one sense, they are the company when on duty. They cannot do that which is not legal and proper for the company to do, and they must do all that is legally and properly required of the company to do, as far as applied to the treatment of persons on the cars, and others who use the streets in common with the company. The reputation of the management to a large extent depends upon their civility, honesty and good judgment, together with their ability to get along with all kinds of people.

"Their duties are fully set forth in the rule book of the company, the division superintendent's list notices, and general orders which are issued from time to time. No person can expect to give satisfaction in whatever position employed unless he knows what is required of him. In order to know what is required of them as conductors or motormen, they must thoroughly and perfectly know the rules and regulations.

"You have passed your examination and are now placed on probation for sixty days, at the end of which time, or sooner if your work is entirely satisfactory, you will receive full appointment. You should understand that the permanence of this full appointment depends entirely upon the quality of your work, and the quality of your work, to a large extent, is governed by your knowledge of the rules and your efficiency in carrying the rules into effect. Ignorance of the rules or indifference to them cannot be

excused, for it is the duty of a good management to detect and remove from the service all men who are incompetent, inefficient or dishonest, in order that the competent and honest men may be encouraged and protected, and thereby the public be properly served.

"It must not be thought that because you have acquired sufficient information to pass your examination there is nothing more to be learned—rather, you should understand that you have learned only enough to warrant your being appointed on trial, and what you learn, and the improvement shown in your work during your term of probation, will determine whether or not you are to be permanently appointed.

"All conductors and motormen remaining in service at the end of one year from the date of employment may be called upon to spend not more than two days at their own cost in re-instruction and examination on their knowledge of rules and duties.

"Motormen breaking in during the winter months in divisions where there are no cars equipped with rheostats will be required in the spring to spend at least one day as learners for instruction on a rheostat car.

"It is the desire of the management of this company to make its car service superior to that of any other company. This cannot be done without the co-operation of the conductors and motormen. Their loyal and hearty support of the management will give them a feeling of justifiable pride in the service to which they belong, and can but conduce to the good of the employee and of the company. Nothing tends more to secure the respect of the public than personal neatness, and this will be required of every employee.

"With the commencement of your service you are beginning to make a record—one which is under constant observation by the public, the stockholders, the inspectors, superintendents and other officials of the company, and this record will always be taken into consideration in forming an opinion as to the efficiency of your service for either discharge, promotion, or annual reward for good service. It depends entirely upon you to make this record a creditable one.

[Signed] "C. S. SERGEANT, Vice-president."

Mr. Learned, in continuing, said that all of the men accepted on the Boston Elevated Railway were handed this circular so that they could understand thoroughly what was expected of them. The new men were provided with a coat as part of their uniform at the beginning of their period of probation. For this coat they make a deposit, which is returned by the company at the close of the service. A full uniform was not required until after the probation period. While the men were breaking in, they received at least \$1 a day; that is, they were guaranteed that amount and might earn more.

L. H. Palmer, Metropolitan Street Railway, New York, said that there were practically four divisions of the subject of training of transportation employees: First, the selection of the men; second, their preliminary training; third, their training for the first few weeks after they were appointed; and fourth, the regular training which continues to a greater or less extent so long as they remain in the service. The Metropolitan Street Railway advertised in several papers continuously for men and it brought good results. Notices were posted in all carhouses asking employees to bring in men who were capable and whom they thought would make good employees. The company kept a record of the sources from which employees were obtained, and of the number of men secured through the advertisements in the different papers. The company's employment office was open during one or two nights each week so that men employed in other vocations could visit it and discuss matters without losing time.

Motormen were put to work breaking in just as soon as they passed the appointment department and had taken the test in the school and while their applications were being

investigated. Conductors, however, were not put on cars until after their applications had been passed. In the preliminary training emphasis was put on the question of getting the men to think, study and reason. In the preliminary training it was wise to impress upon the road instructors the necessity for treating the men considerately. The instructor should make a man feel that he is taking a personal interest in him and would be glad to help him. It tends to hold the men in service.

Mr. Palmer said his company had a chief instructor in charge and one man in the school constantly breaking in the new men and explaining things to men who are sent to the school as a matter of discipline. Also four road instructors were employed. In the conduct of the school practical or homely illustrations were used. All the men were tested particularly as to the range of vision. After a man has been through the school he studies the rules, is broken in on dummy controllers and sent out on the road under an instructor, and his time valued there according to his adaptability and previous experience.

Continuing, Mr. Palmer said that a talk of an hour and a half on accidents was given periodically to the new men. They were also re-instructed in regard to the car equipment; were drilled on how to stop a runaway car and drilled on controller manipulation. After a man had gone through the school he was assigned to a position, and the division foreman then discussed with him the special conditions of that particular division. The division foreman also went over the principal rules with the new man and handed him a letter of instruction very similar to that used in Boston. This letter had to be signed by the man as proof that he had read it. During his first two months of service he was required to attend a meeting of the division office every week. Events which had occurred during the past week which were not right were discussed. A new man was also required to stop a car when the car was running at four different speeds and then to get out and measure the distance which the car ran before stopping. These tests were designed to impress upon the man the facts as to the distance required to make a stop and had proved very important, especially in accident cases. Every six months the general foreman gave to all of the men on the system a talk. This was usually in the spring and fall so that the men could be reminded of the conditions caused by the weather at those times of the year. Representatives of the legal department also addressed all men and sat with the general foreman when he administered discipline. In fact there was a close co-operation on the road between the legal department and the operating department.

N. W. Bolen, superintendent of transportation Public Service Railway, said that his methods were practically the same as those of Mr. Palmer. [The instruction system of the Public Service Railway was fully described in this year's Convention Section.] For several years past the company had endeavored to have the subordinate officials come into close contact with the platform men and treat them as fellow-employees; that is, reason with them and encourage them rather than deal out arbitrary discipline.

In reply to a question from Mr. Allen, Mr. Palmer said that the men were paid regular platform time when attending talks on accident prevention.

#### PASSENGER TRAFFIC

After some further discussion on the training of transportation men President Page said that the report of the committee on passenger traffic would be presented. This report is printed elsewhere.

Charles R. Gowen, passenger agent Oneida Railway, discussed excursion business, chartered cars and his company's methods of advertising. He also said that it was essential that companies which operated parks should maintain them in neat condition.

L. D. Mathes, manager Union Electric Company, Dubuque,

spoke of the desirability of fostering the building up of manufacturing plants along the lines, especially if the company did a lighting and power business. He also thought that it was a good thing for the manager of a public service corporation to take an active part in civic association work.

J. Stanley Moore, of the Beebe syndicate of Syracuse, emphasized the importance of upbuilding everyday business, especially for roads in the Northern States, as the summer was short. There was an active chamber of commerce in Syracuse, which attracted industries to the city. Continuing, Mr. Moore said he thought that every company should not only extend financial assistance to such civic organizations, but that the officials of the railway company should take a direct personal interest in them and assist them in their work. One manager with whom he was acquainted took an active part in the civic association in his city, was chairman of its convention entertainment committee, and was instrumental in bringing conventions and other gatherings to that city. This created business for the community as well as for the street railway. Such an organization had recently been formed in Syracuse and was known as the Syracuse Convention Bureau. The company went quite extensively into the matter of advertising, and whenever it made a change in its timetable the fact was noted. It also saw to it that any timetable printed in any publication was corrected when a change was made. The company did not employ an industrial agent, but it did have a passenger agent. Part of the duty of this official was to get into close touch with the needs of the public, and in the opinion of the speaker it was advisable to have such an official.

The meeting then adjourned.

## OPENING SESSION OF THE ENGINEERING ASSOCIATION

The Engineering Association began its sessions yesterday afternoon in Marine Hall. President Harvie called the association to order at 2.30 p. m. and then presented his address as president of the association. This address is published elsewhere in this issue.

Secretary Litchfield then presented the report of the executive committee, which included the minutes of the meeting of the executive committee and the following supplementary remarks:

### REPORT OF EXECUTIVE COMMITTEE

"A letter ballot was sent to member companies asking for an expression of opinion as to the standards approved by the 1910 convention of the Engineering Association. The vote was as follows:

"(1) Adoption of high T-rail for heaviest service as recommended practice. Yes, 136. No, 18. Blank, 21.

"(2) Adoption of high T-rail for light service as recommended practice. Yes, 133. No, 20. Blank, 22.

"(3) Adoption of No. 0000 grooved trolley wire as standard. Yes, 119. No, 29. Blank, 27.

"(4) Adoption of copper wire table as standard. Yes, 119. No, 5. Blank, 51.

"The 1910 convention also approved of the submission to letter ballot for adoption as recommended practice of the section of T-rail for shallow paving which was submitted in the reports of the committee on way matters for 1909 and 1910. Inasmuch as this rail section has since become the subject of proposed revision by the American Railway Engineering Association, it was not deemed advisable to present this section in the letter ballot at the present time, and the executive committee recommends that the matter be referred to the incoming committee on way matters for further consideration.

"A committee appointed by the president has prepared a set of rules of procedure for the adoption of standards, and it was felt that these rules were of such importance that they should be submitted to the association as a whole for consideration. They are therefore included in the advanced papers for this year's convention.

"A circular letter was sent out to members asking an expression of opinion as to the desirability of continuing the Question Box. The result of the vote was 113 affirmative and 114 negative. Many of the replies advocating the continuance of the Question Box were very strong. On account of this fact the executive committee decided that this feature of the convention program should be continued. The preparation of the Question Box this year was put in the hands of a special committee.

"Arrangements have been made during the year with the American Society for Testing Materials for co-operation between that society and the Engineering Association. The following sub-committees have been appointed to act with committees of the American Society for Testing Materials in the following matters: Heat-treated axles, joint sub-committee of the committees on equipment and heavy electric traction; rolled-steel wheels and specifications for wrought iron, joint sub-committee of the committee on equipment; steel in rails, sub-committee of the committee on way matters."

### SECRETARY AND TREASURER'S REPORT

Secretary Litchfield then presented the report of the secretary and treasurer. It stated that for the year ended Sept. 30, 1911, there had been expended on account of the Engineering Association the following amounts:

On vouchers duly approved by the president and secretary .....	\$3,294
By the secretary of the American Association.....	3,365
Total .....	\$6,659

Mr. Litchfield then gave a list of the purposes for which this expenditure was made. Of the total amount \$3,173 was for the publication of the 1910 proceedings.

### EDUCATION OF ENGINEERING APPRENTICES

Walter H. Evans presented the report of the committee on education of engineering apprentices. He said that the committee had attempted to cover the practical education of the apprentices in the shops and to standardize the system so as to enable an apprentice who passed through the apprenticeship course in any given shop where the system was in vogue to carry on his work as a journeyman fully as well in any other shop. The schedules which were provided, of course, were not recommended as being absolutely standard, but rather as suggestions which the members of the association could discuss. The code of apprenticeship rules was similar to the codes which had been adopted by the steam railroad association.

The electric railway industry had been almost entirely dependent upon men trained and educated in other lines of work, and frequently those who had been trained in electric railway shops had been very indifferently trained. Most of the boys taken into the shops had not developed any intelligent notion of what they wanted to do, and the young men started work principally with a view of having employment, rather than with the object of learning the business. It was true that some of these boys sometimes developed into bright good men, and eventually got to be successful in the business, but their success was not what it should be. If a young man at the start could follow a specified apprenticeship course, so that in the end he would know the business from beginning to end, he would be capable of continuing the work with the company with which he started, or he would be fortified to go out over the country to Denver or to New York City and take hold of a railroad job in a thorough, intelligent and practical manner.

Few realized what poor mechanics were employed in some industries. Frequently men in middle life who had been absolute failures along their line, and who simply wanted a job, started in with shopwork much as they would with a pick and shovel. Eventually some of them developed so that they understood something about the business.

But few men learned after they were twenty-one as much as they could learn from the time they were seventeen

up to twenty-one—in that developing age when we absorb everything like a sponge—of all the essentials and details of this business. Four or five good live young American boys would work rings around all the old men who simply applied for a job.

Edwin D. Dreyfus, commercial engineer Westinghouse Machine Company, Pittsburgh, submitted a written discussion which was read by the secretary. Among other things Mr. Dreyfus said:

"With the growing importance of the engineering considerations and vast detail work of our railway and industrial institutions, there develops a need, and therefore a demand, for training recruits to fill the new and responsible positions constantly created through expansion.

"The courses prescribed in this report are, in many respects, quite similar to those adopted by the large manufacturing companies for their trade apprentices. The engineering apprentices, who are principally drawn from the technical schools, are of course governed differently. There is one phase which, as a general rule, does not receive sufficient attention which bears mention, and that is, the student apprentice should in some way come in contact with the official work of the organization before the completion of his term of apprenticeship in the shops. In our practice we have endeavored to do this, and it is believed it goes far toward crystallizing in the student's mind the intrinsic value of shop experience. On his return to the shop, after having spent from one to four months (preferably the longer period) in the office, he has a better grasp of the work, and accordingly makes greater progress.

"In the shop the student receives experience in testing and assembling of steam turbines, gas engines, condensers, etc. In the office he has an opportunity to analyze tests and weigh results, and to acquire an appreciation of the details of construction and their utility. With a liberal policy toward the apprentice, it is found that it broadens largely his conception of engineering problems; and the results achieved by this method are borne out by the success of men graduating from this course and entering upon power house work with operating companies."

Mr. Dreyfus appended to his letter a copy of the rules governing the engineering apprenticeship system of the Westinghouse Machine Company.

W. H. Adams, Metropolitan Street Railway, New York City, said that he appreciated the necessity of having young men educated in the manner outlined in the report. The electric railways were constantly in need of foremen, inspectors, or men to fill positions where the general knowledge acquired in the branches of this character would be of great value. He believed that probably there would have to be outlined a course to suit particular conditions. It would be very desirable in order to familiarize the apprentice at the start with the necessity of keeping track of the forms and the necessary details of the office end as well as the various storerooms and departments. The suggestion made by Mr. Dreyfus that when an apprentice had completed his course then he could be put in touch with the organization force of the department was also good. His company had no course of this character at the present time, but would probably start one in the near future.

Paul Winsor, Boston Elevated Railway Company, said that the Boston, his company, had no regular course; he hoped that the company would establish such a course at an early date. It had a good many apprentices, some of them in the car shops, and some in the power shops, but had no regular course. Besides these boys, they had five technical students whom the American Electric Railway Association had arranged for. That was a trial course of only two or three months. They also had ten young men from the Young Men's Christian Association of Boston, working in teams or pairs of two each. They had a week's schooling and then a week's work, and that had worked out very well.

Charles Hewitt, Philadelphia Rapid Transit Company, asked why this course should be confined entirely to the shops. While he realized that the details of car equipment and shop work were much more important than any other part of the mechanical or electrical work connected with the street railways, at the same time it seemed to him that the young mechanic should have this course rounded out, by some portion of the time being devoted to power-house work. This was particularly true with companies using high-tension, alternating distribution. He might also have some knowledge of line work and the distribution system. The broader the grasp that he got of power generation and the distribution, the more valuable would be his services in the other lines.

Fred G. Simmons, Milwaukee Electric Railway & Light Company, discussed the report outside of the strictly shop and rolling equipment work. The time was ripe when something should be done relative to the training of young men in the various lines of street railway engineering. He had gathered a great many ideas as to apprenticeship courses from reading a description of the apprenticeship course of the Atchison, Topeka & Santa Fé Railroad, written by Mr. Going. It was necessary to do more for the apprentice than simply to lay down the hours of study and the details of this course through the shop. This applied more particularly to the larger organizations. Provision should be made for a certain amount of classroom study in connection with the other parts of the apprenticeship course. The young men secured as apprentices had a comparatively limited education. The Santa Fé system only provided the equivalent of a sixth-grade education, but that was supplemented during the apprentice's term by regular classes, which the apprentice attended during working hours, and during the time they were in attendance in the classes they were paid their regular wages, so that there was no excuse for lack of interest on the part of the apprentice, which might be the case if the apprentice was asked to attend these classes after working hours, when he would rather be occupied with matters of recreation. These classes exerted a certain amount of moral influence on the boys.

F. J. Doyle, Schenectady Railway Company, thought it would be a good thing for the apprentice to enter the various departments and gain some knowledge of the operation of each.

Farley Osgood, Public Service Electric Company, Newark, N. J., heartily indorsed the views of the speakers who advocated a theoretical education in connection with the practical education. He had had considerable experience with apprentices, or cadet-engineers. His experience had been that unless they were given the theoretical training they cannot be advanced beyond a certain point. They did not know how to think about their new work. A theoretical training, to prepare them for the practical training which they received in the shops, was absolutely essential if the men were going to make a success. The class work must be arranged for in conjunction with the practical work during the time for which the apprentice is paid by the company, and not in his own hours, when he is not serving it. The committee's plan as he understood it eliminated from the course boys who had had any technical training. Many boys from the manual training schools, of seventeen or eighteen years of age, were ready to take up such a course as the committee had outlined, and they were ambitious to earn something and be on their way toward their life's work. Why not admit these boys?

Charles Hewitt said that for a year or two past his company had been giving preference to the manual training school boys, for the reason that they had the groundwork to comprehend the training which was given them, and they made a much better class of apprentices.

E. J. Burdick, Detroit United Railway, said his company fully appreciated the apprenticeship course, and was following it quite closely, although not exactly along the lines

suggested by the committee. He had found it an excellent idea to secure young men from the Young Men's Christian Association who had taken the mechanical and electrical courses, or young men who had ambition to take the mechanical or electrical courses in the night schools. These boys were generally made of the right kind of timber, and they did very well. In furtherance of the plans to educate apprentices the company had established a circulating technical library, and encouraged the men to read these books. The library consisted of about 300 volumes, and there were always at least one-third of these books circulated and being read by the apprentices.

President Harvie asked the committee if it contemplated applying the educational course to take in the power department and also the way department.

Walter H. Evans said that the committee felt that it was the equipment end which seemed to be most in need of first attention. The committee was trying to keep away from a technical graduate course and to take care of the fellows who are on the job day and night; the fellows who go down the road at any hour of the day or night, irrespective of weather conditions, and fix up a car, and are satisfied to work at the prevailing rate of pay for this class of work.

William Roberts, Northern Ohio Traction & Light Company, said that he had had some very pleasant experiences the last few years with the young men who had come into the employ of his company. There were many young men who mapped out a course for themselves and sought the aid of various educational agencies in helping them to acquire knowledge. Something ought to be said in favor of the correspondence schools for young men. He had a number of young men who were studying in their own time, and he thought that was the best way to develop the men. Some of them were working every night until midnight. While he appreciated the value of manual training schools and the opportunities given to young men through the Young Men's Christian Association, he thought some appreciation should be shown of the work which the correspondence schools of the country were doing for young men. They were developing young men of splendid talent, full of ambition, who were securing a good education.

Farley Osgood said that the Public Service Corporation took none other than college graduates in the power transmission department. Men who did not have a college education lacked the theory and were not capable of holding a supervisor's position or an assistant division chief's position. The technical man usually made good, as he had the technical and the theoretical training to start on. No special time was stated in the apprenticeship courses. A man was changed from one class of work to another when he perfected himself in his work, or if a man showed lack of interest in what he was doing he was changed if it was thought that he possessed merit. A young man just from college did not really know what occupation in life he would follow. He was no good to anyone until he had had three or four years' practical work. For this reason the management did not hesitate to shift the apprentices around from one occupation to another when it was apparent they were losing interest in the work in which they were engaged. Oftentimes such a change worked remarkably and made a good man of the apprentice, whereas under other conditions he might have been a failure.

The telephone companies had a students' course for a number of years, but did not have a regular students' course at this time. In the telephone method of education the men were given work which covered various periods in all branches of the service, and they were generally trained. During this general training, as a rule, they developed a capacity for some specialty, and if they did this they were particularly developed along the special lines for which they displayed aptitude.

William Roberts said his experience had been diametri-

cally opposite. In the last year or two he had had young men come to him who were technical graduates. The man who would be the most useful in the end was the man who by hard work educated himself and who showed by his attention to business and his hard work and his ambition that he wanted to rise and needed a helping hand.

Paul Winsor said that in Boston there was every opportunity for a young man to learn the technical side of engineering, but they had nothing to train the mechanic. They have had a good many apprentices in the various departments who were not working under any organized system. Monthly meetings had been started with these men, which were taken charge of by the men in charge of the motor repairs. The pit men were also invited to go to these apprentice meetings, and many of them went. Thirty or forty people attended these meetings, including the apprentices.

Walter H. Evans in closing the discussion pointed out that the course was not for technical engineers but for the education of mechanics. The education of apprentice engineers was an entirely different field from the one the committee attempted to provide for. He was not willing to agree with Mr. Osgood that there was any particular dearth of engineer apprentices or engineers, but there was serious trouble in obtaining efficient mechanics. The course outlined was intended to take care of the boys who not from choice, but from rigid necessity, were compelled to go to work when they were seventeen years old. The object was to develop those boys into good, thorough-going mechanics, and to provide a regular system so that the boys would know and the foreman would know the routine that the young men were to follow.

Very early in his experience he had charge of a shop with about twenty-five apprentices. Many of those boys were now holding good positions all over the country. It was with keen satisfaction that he looked back and realized that he had done something to advance the interests of those young men. On the Indiana Union Traction Company he had five apprentices, three from the rolling stock department and two from the power house, and it was very encouraging to notice the alacrity and interest which those young men developed. In his department he had twenty-five applicants, some of them nearly forty years old. In one place where he took charge he found a bright young man who had been winding fields of the same kind for three years. When asked why he was doing this work all this time the man replied that he had never been given an opportunity for any other work. Almost immediately he developed into one of the best men in the shops when he was given an opportunity.

When an apprentice developed into a laggard it was a good method to move the next one ahead of him, and if that did not spur him up it was time to get rid of him. Usually it spurred him up and he developed rapidly after that. He wanted to point out that the report of this committee did not in any way conflict with the report of the committee on education of the American Association, although the line of work which the committee of the American Association was attempting to do would fit in very nicely with the work outlined by this committee. The apprentices would naturally be interested in the correspondence or academic features which the American Association has attempted to outline.

#### POWER DISTRIBUTION

A. F. Hovey, Interborough Rapid Transit Company, New York City, presented the report of the committee on power distribution. Referring to the specifications for three-conductor cables under the heading of "inspection and record of tests," he called attention to the fact that it was necessary for the manufacturer to notify the contractor on the completion of the order of cable unless expressly agreed to the contrary.

Blanks had been left under the heading of cable protection in manholes because there was such a great deviation in covering cables that it was impossible to meet

everybody's ideas, and the method of applying the asbestos and the other coverings was left open.

The joint report on specifications for overhead crossings of electric light and power lines was very important. Farley Osgood, member of the committee representing the National Electric Light Association, and R. D. Coombs, representing the committee on electricity of the American Engineering Railway Association, had been invited to discuss this part of the report.

E. N. Lake, Board of Supervising Engineers, Chicago Traction, called attention to the conductivity of annealed copper wire required by the specifications for cables, which was 98.5 per cent. This was a very reasonable percentage in view of the fact that in a great many tests the conductivity will run 100 and 101 per cent. Arsenic affected the conductivity particularly. He thought there would be some difficulty on the part of the manufacturers in supplying a compound that would be soft and plastic at all seasons of the year.

Under the heading of tests for potential stress in cables the application between each conductor and all the others connected to the lead sheath involved two applications of the potential stresses between the conductors and one application of the potential stresses between the conductors and the sheath. The application between each conductor and sheath and the other two conductors successively would involve two applications of the potential stress between individual conductors and also two applications of the stresses between individual conductors and the sheath, which would be a more logical application of the tests. With regard to the requirement that the cable must not show any weakening of its insulation or any other injury under this test, the question might arise as to what would be a showing of injury to the cable under the potential stress. As to the amount of potential used in the potential test in the three-conductor cable, 6250 volts was required for a three-conductor cable, while for a single-conductor cable 5,000 volts was used. The speaker asked why the higher voltage was not satisfactory even though the cable was to be used for a lower working potential.

With reference to the insulation tests of 30 per cent Para rubber the value given in the specification for 5/32-in. insulation was 420 megohms per mile. This corresponded to the specification drawn up by the Rubber Covered Wire Engineers' Association. He asked whether there had been found any objection on the part of the manufacturers to materially increasing that resistance.

A. F. Hovey said the committee thought that was a sufficient test. It coincided with the specifications of several operating companies, and it also coincided with certain manufacturers' specifications.

G. W. Palmer, Bay State Street Railway, Boston, said it was very easy to obtain a considerably higher test than was specified, and there would be no objection on the part of any manufacturers to furnishing such a test. But to make a cable to stand this higher test involved a tighter wrapping of the paper and a harder and less flexible cable. A cable which would stand at least the test which was prescribed was more apt to be flexible in continual service than one which was tightly wrapped and would give a higher insulation test. Any cable which would satisfy this test had sufficient insulation to meet all requirements.

E. N. Lake said that so far as the paper cable was concerned 50 megohms per mile was perfectly satisfactory. Such insulation would stand the pulling and handling under cold weather conditions much better than cables which had an insulation resistance of 100 megohms. His question was in regard to the 30 per cent Para rubber specification, whether it was desirable to give those qualities and whether the manufacturers would make a corresponding increase in price.

Mr. Hovey, Okonite Company, said that the experts of

his company thought it was highly desirable to increase the megohm test to at least double the value specified. The Railway Signal Association had this matter under consideration, and its committee has recommended that the megohm test be increased to practically double. He was of the opinion that the manufacturers would not increase the price.

Referring to the physical test, he recommended that the potential stresses be made 1000 lb. per square inch, instead of 800 lb. The compound which would comply with the 30 per cent Para specification would stand 1000 lb. per inch and still have a margin of safety. He also recommended that the breaking test be made 10 in. instead of 9 in. The last paragraph under "Physical Test" should be left out, as there was no reason why a thick piece of rubber should not stretch as far as a thin piece of rubber. Under "Chemical Tests" he thought it was desirable to have a specific gravity test added, for the reason that a manufacturer might use a light filler, and therefore make his compound more bulky; and as the insulation is measured by the thickness, a certain bulk would cover more length and wire, and consequently there would be less rubber per foot, and therefore a less effective and lower insulation.

The speaker thought that the vulcanizing should always be done before the compound was covered with tape or braid, and that the test should be made before the tape or braiding was put on, as a new tape might cover a defective test or cover up a place which would be detected if the compound had been left bare. The time specified should be 36 hours, instead of 20 or 24 hours. Referring to the table giving insulation thickness in inches, he thought there was nothing to be gained by testing at such a high voltage as required, and that there was danger of injuring the insulation and causing an injury which would not be detected. He would recommend that this test be left off, or a lower voltage used. It was possible to injure rubber insulation and not cause a breakdown which would be detected at that time, but later it would be developed.

E. N. Lake took issue with the representative of the Okonite Company with regard to the question of immersion. Ordinary braid used for holding the compound in position while it was being vulcanized had been shown by test to break down after two hours' immersion; that is, after two hours there would be no difference in insulation resistance with and without braiding. From the standpoint of the engineer, and taking the practical side of it in the factory into consideration, 20 hours would be the standard which he would recommend.

William Roberts appealed to the members present for some information on the construction and erection of concrete poles. The committee had found since the report had been printed that a large amount of erection and construction of concrete poles had been going on. One city which had extensively entered into this type of construction was Toronto. It was a very interesting field just now in long distance transmission work.

R. D. Coombs, New York, said that the cost of concrete poles depends altogether on the class of line and the location and whether there is time to utilize all the possible economies. Where a pole line had to be constructed, stock material bought, twice as many men and twice as many forms used as were absolutely necessary to erect it, and so far from a track or beaten path that derrick cars could not be used, it would be an expensive construction. Where the line was equivalent in type and strength to the ordinary transmission line of say twelve wires at the maximum, the line could be built at comparatively low cost. Its first cost would exceed that of a wood line, but its long life would effect an economy. The argument of some engineers was that within a few years, if the price of wood continued to increase, concrete poles would be economical; but they were not so at the present time. The Toronto installation of which Mr. Roberts spoke was the largest and cheapest installation actually constructed thus far. The poles

were small and very light, and were used for distribution, not for transmission purposes. They were made in a casting yard, with rows of forms, over which ran a traveling carriage bearing the concrete. The erection of concrete poles, if the location is not unusual, was the same as the erection of wooden poles. A gang which could erect a large number of wooden poles could erect about the same number of concrete poles. If the concrete poles were in a bad location it cost a good deal to stand them up, because they were heavier.

Mr. Roberts asked Mr. Coombs if he was prepared to indorse the figures cited in the report as to the cost and erection of reinforced concrete poles.

Mr. Coombs thought the figures were entirely too low. About one year ago he erected thirty-one poles carrying twelve wires on the ordinary spacing. These poles cost about \$10 apiece to make. They were comparable with a good chestnut pole of about the same size and perhaps a little bigger diameter. Two poles would cost a great deal to make; 200 poles would cost much less per pole; the cost for material will be about the same, but the forming and superintendence and the working of two poles runs to a very high factor; so that he thought that a cost of \$3 or \$4 per pole at the present time was an exaggeration.

L. P. Creelius, Cleveland Railway Company, said that eighteen months ago that company had made forty-three concrete poles which had been placed in pretty severe service. After a year's trial the company decided to build more. It was now making 500 poles, of which 200 had been installed. The pole was essentially different from that mentioned by the previous speaker, because in a transmission line a pole did not have such a transverse strain as a trolley pole, which required stronger reinforcement. The poles cost to make about \$10.71 each. There was no greater difficulty in erecting them than with an ordinary tubular pole. The pole was a fine looking structure in the street, much better than a steel pole. The pole had a top pull of about 1500 lb. or 1800 lb., and was 28 feet long. Compared with the ordinary 7-6-5 standard tubular pole, its cost was in the ratio of \$10.71 to \$16.38 delivered. The method of attaching the span wire and the feed wires was exactly the same as with a tubular pole. Malleable iron was used for the cross-arms and collars for the strain insulators. The pole weighed about 2200 lb., and contained eight twisted-steel reinforced bars. The pole was octagonal in shape and tapered from 10 in. at the butt to 5.5 in. at the top. On the tension side and starting 6 ft. from the ground, slight cracks had appeared and went through the nearest reinforcement, so that the pole was only in the experimental stage. Its life could not yet be determined. The pole was to be used in replacing old wooden poles in outlying districts and not in place of steel poles.

Harry Barker, *Engineering News*, asked if any of the delegates present who had used reinforced concrete poles had any information to give on the matter of the electrolytic destruction of these poles. He said that where reinforced concrete was subject to direct current there was apt to be a destruction which arose in two ways. With a large current of 5 amp. to 10 amp. may come localized thermal effects which take place within a few hours; with a smaller current of a fraction of an ampere, flowing for 35 or 40 days, the same result was accomplished, but the trouble was more apt to be found in cities and was not due to the leakage current. With trolley poles of reinforced concrete there might be enough leakage in wet weather to allow 4 amp. or 5 amp. to pass from the iron through the concrete to the ground, and in that case in a single day some cracking of the concrete away from the reinforcing might be expected. Defective insulation in some of the poles, enough to allow a fraction of an ampere to pass continually for several months, might also lead to disintegration. When the bonding between the concrete and the reinforcement was gone at the base, a small top pull might overturn the pole.

Farley Osgood said that he believed that the proper bonding of the reinforcement of the concrete would take care of the difficulty which the last speaker mentioned. It could be done just as the steel work on a reinforced concrete building is bonded. He called attention to the fact that many railroad companies did a lighting business also, and in many cases combination poles were used. The enthusiasm for concrete poles would be somewhat checked when considering carrying lighting circuits on the same poles, because the lighting circuits carried over 2400 volts, on primary circuits, and it was dangerous for linemen to work on concrete poles carrying such voltages, with the wires alive, which they had to do. That point could not be overlooked in the joint use of poles.

G. W. Palmer said he had not had any experience in the use of concrete poles, but from his experience in the use of wood and iron poles they were open to the objection of electrolysis depreciation. It would require but a comparatively small amount of current, such as could get down an iron pole, to set up such oxidation in the reinforcement as to result in the cracking of the bond between the concrete and the reinforcement. He would expect these troubles to develop in the use of concrete poles for the ordinary side pole construction.

R. D. Coombs asked whether electrolytic action was likely to occur in view of the fact that the reinforcement was continuous from the top of the pole down into the ground. Would not the current go out at the bottom of the pole? The conditions, no doubt, were different in the use of concrete poles for trolley work in the city and in the transmission field, but it was a fact that reinforced concrete poles had been used for transmission lines abroad for ten years on high tension work. There was a pole line near Niagara Falls which had been in use for five years, which had given satisfactory service.

Harry Barker said that the effect of electrolysis on reinforced concrete had been developed largely in laboratory studies. There had been some attempts at field tests, but they had not amounted to much. With alternating current, such as is carried on transmission lines, the evidence was all negative. He had some tests under way that would not develop anything for three or four years. If they did not show any cracking within that length of time it would be more certain that alternating current has little effect. The destruction came where the current left the iron for the concrete. In the case of a trolley pole, where the base was buried from 4 ft. to 6 ft. beneath the level of the tracks, any leakage current would leave the pole at or near the ground line for the rail, allowing the current in that way to pass from the iron to the concrete, which might result in a rupture of the bond close to the ground line. If there was a sufficient conductivity between the reinforcement brought out at the bottom of the pole, that might prevent electrolysis. In the case of some reinforced concrete buildings where incipient trouble had been suspected an attempt had been made to prevent further destruction by carrying the bonding of the reinforcement through the building. Apparently that had served its purpose. Another thing which might have to be done in the case of reinforced concrete poles was to provide a membrane of waterproofing and insulating material, such as felt soaked with asphaltum, etc., with a good thickness of asphalt on top, where the pole was buried in the ground, so that the pole would be insulated thoroughly from ground water.

William Roberts did not think there could be any effect of electrolysis if the reinforcing were bonded to the rail, but the great trouble would be the danger of working on the pole, because there might be a leak in the insulators. It might be all right in dry weather, but after a rainstorm there might be some displacement of the reinforcement so that a current of high potential would overcome the resistance and break through and be very dangerous for anyone engaged in working on the pole. The matter of electrolysis



could be taken care of by a direct return through to the reinforcement of the pole. It was difficult to make a reinforced concrete pole absolutely safe from electrolysis.

A. F. Hovey, in closing the discussion, said that the question of conductivity was considered thoroughly by the power distribution committee last year, and the committee this year made the same recommendation. In regard to the compound spoken of by Mr. Lake it might be difficult to get a compound that would keep sufficiently soft and plastic at all seasons of the year. His company had not had any trouble in obtaining a compound that would stand under any temperature and still remain soft. His specification stated that the purchaser must be allowed to install the cable in ducts anywhere between 0 and 100 deg. Fahr., and that necessitated a soft compound. The first specification upon which action was desired by the committee was the specification for high-tension, three-conductor, paper-insulated, lead-covered cables.

Martin Schreiber, Public Service Railway, Newark, moved the adoption of the specifications. The motion was carried.

The specifications for single-conductor, paper-insulated, lead-covered cable for 1,200 volts were accepted and referred to the committee on standards.

The next question taken up for action was the specification for 30 per cent Para rubber compound.

G. W. Palmer answered the objection to the provision that the insulation test should be made before the application of any outer covering by saying that it was found that if it was specified that the test should be made before the application of any outer covering whatever it would shut out a number of good makes of wire. In some of the methods of manufacture of smaller sizes of wire an outer covering of tape or braid was necessary to hold the thin layer of rubber on to vulcanize it, and if that was not allowed it would shut out a number of good makes of wire. As to the suggestion that the test of 800 lbs. should be increased to 1000 lb. the committee found a number of samples of 30 per cent Para rubber which afforded very good insulation and otherwise met the requirements, but would not stand a 1000-lb. test.

H. H. Adams said that the question of 30 per cent Para rubber compound was one which affected the equipment committee. A good deal of the wire included in the sizes specified was used on cars. He moved that this specification be referred back to the committee, to be taken up in conjunction with the committee on equipment, to be reported on at the next convention. The motion was carried.

The recommendation for standard grooved trolley wire in sizes other than No. 0000 was approved and passed to the committee on standards. The specifications for No. 00 round, hard-drawn copper trolley wire were also approved and sent to the committee on standards.

The specifications for overhead crossings of electric light and power transmission lines were approved and recommended to the committee on standards for adoption as a standard. The subject of concrete, latticed and tubular poles was referred back to the executive committee for further consideration.

The meeting then adjourned.

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The Pantasote Company, New York, N. Y., shows at space 301 a section of a car illustrating the application of agasote headlining. The headlining shows a light blue, smooth finish. Although on the market in the United States for only about three years, agasote is now frequently specified for subway surface and elevated car headlinings. It is a board of homogeneous waterproof material of great density and tensile strength. There are also shown car seats upholstered with pantasote. The pantasote and agasote representatives are John M. High, William A. Lake, Allan S. Barrows.

## COMMUNICATION

### RAIL CORRUGATION

GOLDSCHMIDT THERMIT COMPANY

New York, October 4, 1911.

To the Editors:

I was much interested in the editorial comment on my theory of rail corrugation which was published in *ELECTRIC RAILWAY JOURNAL* of Sept. 30, 1911, but it seems that you have overlooked some important points in the theory, which led you to draw erroneous conclusions.

Considering first the statement that "if corrugation was dependent entirely upon the size of the area of contact and its position on the head of the rail it would follow that all rails of the same section held on the same foundation by the same attachments and subjected to the same traffic would develop corrugation to an equal extent," while this may be true in so far as the premises upon which it is based are true, I endeavored to show both by the text and sketches in my article that in track laid with rails of the same section held on the same kind of foundation by the same type of attachment and under the same traffic conditions both the size and location of the contact area are materially changed by numerous apparently unimportant details in laying track and that rails with heads similar to those of the usual girder type are affected to a much greater degree than is the case with T-rails or rails with a rounded head.

The effect of such a slight change as the elevation of the outside edge of the base of the rail  $\frac{1}{4}$  in. was shown both for girder rails and for T-rails, as was also the effect of various track and wheel gages. It would not be difficult to point out causes for many such differences in track laid with the same material. Further, the theory does not "presuppose that the load on T-rails or on those which develop corrugation is normally at the center of the rail and that on girder rails which develop corrugation at the side of the head." What the theory does presuppose is that where corrugations occur the point of maximum intensity of pressure approaches sufficiently near the edge of the rail to reduce the elastic limit of the steel from its cubical value to its linear value, a quite different thing. Nor is it claimed that corrugation will appear on all track laid with rails having flat heads if the relation of the tread of the wheel to the rail surface is such as to make contact across the entire head at all times, as it is obvious that the intensity of pressure will not only be reduced but that the point of intensity of pressure will not fall near the edge of the rail, the different parts of the head taking the load in inverse ratio to the power of resistance.

If rails with flat heads could be laid and maintained at all times so that the point of maximum intensity of pressure between wheels and rail fell at some distance from the edge of the rail, corrugation would not be produced except under conditions noted in the statement of the theory. Further, as has already been stated, if the rails were free to adjust themselves under pressure, the shape of the head would not be of so much significance, and the chief claim made for the rounded head is that there can be a considerable variation of the relation between the wheel and rail without altering materially either the size of the contact area or its location, which was clearly shown by the sketches in my article.

G. E. PELLISSIER,  
Superintendent.

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Maybe we will be running electric railways in the air and over the water some day. A visitor at the McQuay-Norris Manufacturing Company's booth was looking for packing rings for a hydro-aeroplane. He was an aviator.

REPORT OF THE COMMITTEE ON PASSENGER TRAFFIC\*

BY L. D. PELLISSIER, CHAIRMAN; F. G. BUFFE, FRANK CAUM,  
E. C. HATHAWAY; J. E. GIBSON, T. A. CROSS

During the year the general subject of "every-day" business was investigated, including a study of methods and results of civic organizations. A considerable fund of information has been collected touching on civic organizations, newspaper advertising, advertising costs, the employment and duties of industrial and passenger agents, commutation rates, etc., which will be found on file in the secretary's office arranged in convenient reference form.

CIVIC ORGANIZATIONS

Data furnished by member companies reveal the impressive strength of civic pride among the citizens of American cities. It shows, too, that much of the effective work has been done by organizations in the very small communities. Information has been collected from companies operating in about 100 cities with populations ranging from a minimum of 4400 to a maximum of more than 2,000,000, and in every one of the cities and towns there is a civic organization of some sort.

These civic bodies are active in a variety of ways. Many of them have paid secretaries who devote their entire time to the work, while others carry out extensive programs by means of committees. Considerable traveling is done by officers, personal appeals to convention bodies are made and a great deal of magazine advertising is carried on. In many cases free factory sites are donated or bonuses paid, in other cases factory owners are permitted to extend payments over a period of years. Attention is also given to freight rates. With few exceptions the companies co-operate with the civic organizations, though sometimes through officials as individuals only, and in many instances, in addition to dues, substantial financial assistance is given. A great many of the companies call particular attention to the very active interest taken, and not infrequently their officials are leaders in the work as shown by the fact that two companies report an executive official as president of the civic board, another one of its officers as vice-president, and still another its general manager as a member of the executive committee of the civic organization. By far the greater portion of the efforts of such bodies is along lines which directly and, if successful, advantageously affect the "everyday" business of the electric railway companies. The committee suggests that the member companies individually consider their respective civic organizations with a view to such active co-operation and support as the objects and plans of such bodies seem to warrant.

NEWSPAPER ADVERTISING

The committee requested information on the general practice of the members in regard to newspaper advertising.

The following table shows the extent and character of newspaper advertising:

	None	General advertising	Sched- ules	Changes in sched- ules
City lines only.....	25	23	9	2
City and interurban lines.....	7	12	5	0
Interurban lines only.....	2	9	2	1
Total .....	34	44	16	3
How paid for:				
Cash .....			44	companies
Mileage .....			11	"
Cash and mileage.....			8	"

Twenty-two companies report that they carry permanent or special advertising affecting public relations in newspapers. Some few additional companies carry such advertisements inside cars, others in company periodicals, while one uses a talking sign. Fifty companies do no advertising

\*Abstract of report read before the American Electric Railway Transportation & Traffic Association, Atlantic City, N. J., October 9-13, 1911.

of this character. Additions, improvements and extensions of lines, equipment and service are best treated in reading notices and editorials and natural attractions along the routes should be described in legitimate advertising space. Advertising on the fronts of cars should be confined to attractions controlled by the railway company and other events of general interest.

INDUSTRIAL AGENTS AND PASSENGER AGENTS

None of the companies responding have employed agents who devote their entire time to the development of industrial affairs along the line of road. Some effort to bring about the location of factories, etc., has been made by officials of the various companies, and one line reports the location of four grain elevators, tile works and a sawmill, as the result of these efforts. Twenty-eight companies do employ and fifty-nine do not employ passenger agents. Of those companies maintaining passenger departments eighteen operate interurban or city and interurban lines, and of the fifty-nine which do not maintain them twenty-two operate interurban or city and interurban lines.

DISTRIBUTION OF FOLDERS AND PRINTED MATTER

The replies to the inquiry as to the methods and cost of distributing advertising matter showed the following information:

Distribution	No. of companies	Cost per 1000 folders
In cars only .....	1	....
In stations only .....	1	....
In cars and local delivery.....	1	\$5 00
In stations and local hotels.....	2	60
In local hotels by agents.....	2	....
In cars and through distributing agency to state hotels .....	2	8 33
In cars, hotels, houses, etc., and mail to territory served .....	2	22 00
In cars and through trainmen and boatmen.....	1	50
In stations and towns by agents.....	1	3 50
Inspectors hand to passengers.....	1	....
Mail and house to house.....	1	1 00
Local .....	10	....
State .....	4	1 00
State and adjoining states.....	2	....
Country-wide .....	1	10 00
Chamber of commerce.....	1	....

With regard to permitting outside agencies to prepare traffic circulars free of cost to the railway company, such agents to reimburse themselves through advertisements, forty-four companies state that they do not permit this, while twelve say that they do. As to whether the savings effected in this way provide a real economy, fifteen companies claim that they do not consider that it does, and five state that such savings are worth while. One of the principal reasons advanced by the companies opposed to the plan is that the time-tables are not kept up to date. The plan of permitting outside agencies to prepare circulars of this kind free of cost to the railway companies is unsatisfactory, because it tends to impair the value of the publicity which the company desires to obtain and the saving effected does not justify the adoption of the plan.

COMMUTATION RATES

The replies received show that twenty-five companies operating interurban lines issue commutation rates and nineteen companies do not; that thirteen companies believe such rates to be profitable in themselves, and ten companies consider them unprofitable. Eight companies feel that commutation rates induce sufficient regular riding to make them a source of profit and nine companies state that such rates are not responsible for any substantial increase in regular business.

MISCELLANEOUS

The extent to which the members have taken up the matter of a company magazine is limited. Out of one hundred responses only five companies report that they issue such a publication and two state that they have in the past issued a book of this kind but have discontinued the publication of same.

The stimulus to traffic on interurban lines through merchants paying fares of customers, providing transportation

to and from terminals, free delivery of packages, etc., and the benefits accruing to the railways from such plans was investigated. The merchants in seven localities pay the fares of their patrons (under certain conditions as to amount of purchases); in six localities they pay both fares and express or freight charges. In one instance the merchants operate a special car which has proved very successful; in another case the merchants operated a special car which was withdrawn because it was not profitable. In several other cases merchants adopted plans of this nature during so-called merchants' weeks, with results, however, that have not been altogether successful. As to the benefits to be derived from co-operation of this kind, seven companies state that the results have been satisfactory, and five declare otherwise.

Among the ideas expressed regarding the development of "all-the-year-round" business are the following: Movements to bring about intercourse between social organizations of different cities and communities, theatre parties, advertising trolley trips on backs of transfers, co-operation and interchange of passengers with an independent steamboat company operating between termini of interurban road, follow-up work in connection with proposed excursions, and the advertisement of special attractions by means of banners on the outside of cars.

The committee wishes to sound a note of warning against the introduction of low-rate tickets as a means of developing "every-day" business, and to suggest that before offering inducements of this kind all companies give the subject long and serious consideration from every point of view as a matter which is likely to be far-reaching in its effects and, eventually, detrimental in results.

## REPORT OF THE COMMITTEE ON EDUCATION OF ENGINEERING APPRENTICES\*

BY WALTER H. EVANS, CHAIRMAN; W. G. GOVE, H. A. BENEDICT

The work assigned to this committee pertains to the practical training of engineering apprentices, with particular reference to the mechanical and electrical trades employed in and around the various shops and car stations. It was considered advisable at this time to confine investigation to that class of engineering apprentices which will be employed in the maintenance of electric railway equipment in the rolling stock department. The manner of maintaining electric railway equipment in our shops and repair stations differs very considerably from that employed in other character of railroad or manufacturing work. Therefore it would appear particularly desirable to develop a class of mechanics especially fitted by training and experience to properly take care of electric railway equipment.

There has never before been a time when a greater necessity existed for the proper training and drilling of young American boys along the line of mechanical trades. It would appear that a great amount of valuable material is now being wasted because of the lack of drilling and instruction at the proper age. This is especially true in the electric railway business, which offers an especially inviting field for young men to prepare themselves not only for present requirements but for the future as well.

A "Code of Apprenticeship Rules," taken from that adopted by a similar association a number of years ago, is submitted as a general recommendation and opinion which might be investigated and adopted, with such changes or revisions as would seem to be necessary.

It is expected that this code will apply to all classes of apprentices for the various trades employed in electric railway general shops. Where the shops are sufficiently exten-

sive and the work is sufficiently segregated, it will no doubt be desirable to employ apprentices in each trade with a view to developing the highest character of mechanics.

The committee calls particular attention to the development and training of mechanics for the purpose of maintaining electric railway rolling stock equipment. These tradesmen would be designed as "electric car mechanics." Your committee would, therefore, submit the following schedule as a recommended forty-eight months' course of training in developing a thorough electric car mechanic, but with the distinct understanding that it is to be flexible as regards both the term of service to be spent on each item, and also, in the whole course, the qualities and capacity of the individual boy.

### ELECTRIC CAR MECHANIC APPRENTICESHIP COURSE

(1.) Start in the toolroom, storeroom, or messenger in the shop office, to become acquainted with the use of small tools, and familiar with the name and character of material, tools, reports, forms, etc. Here he should also develop a legible hand and make satisfactory reports. Time—four months.

(2.) Helping on general machine shop work, small tools, drilling machines, shaper and small lathes—six months.

(3.) Blacksmith shop, three months as helper, three months on small fire on general work—six months.

(4.) Machine shop, general instruction in machine work, milling machines, axle lathes, boring mills, larger lathe work, etc., and better class of bench work—six months.

(5.) Coach shop, car trimmings, light coach repairs, glass fitting, etc.—four months.

(6.) Pipe shop, pipe fitting and air brake apparatus—four months.

(7.) Armature and field winding and repairs—six months.

(8.) Gang work, overhauling and repairing trucks and motors—six months.

(9.) Control apparatus repairs, wiring, wiring diagrams, drawings and general testing work—six months.

It is recommended that in case apprentices are taken for any regular trade some definite schedule be developed covering the full apprenticeship course. It is recommended that apprentices should preferably begin when seventeen years of age. The practice in a number of localities provides a scale of wages for apprentices with rates per hour according to the following plan:

First year, 10 cents; second year, 12½ cents; third year, 15 cents; fourth year, 17½ cents.

Where the policy of the company will permit and the custom prevailing in the localities justifies, it is recommended that some inducement be held out to the apprentice to complete the full course and receive his "certificate of apprenticeship." This is desirable, both from the viewpoint of the employing company and that of the apprentice himself.

At this time some effort is being made along this line by a committee on education of the American Electric Railway Association, and a number of special apprentices have been selected from different companies throughout the country who will receive special instructions in shops, power houses and substations. It is understood that the result of this experiment will be the subject of a report of that committee to the main association at this convention.

It would appear that the character of training and the policy pursued by the committee on education of the American Association is necessarily of an academic or correspondence school plan, and consequently would not appear to conflict in any way with the recommendations of your committee, but, on the other hand, would be supplementary and possibly helpful to the plan which we recommend.

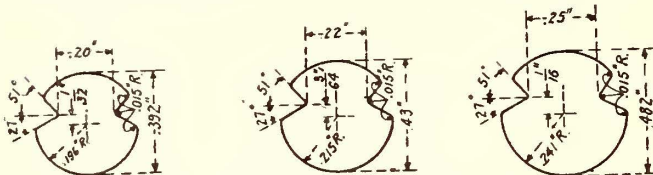
Your committee recommends that a committee on the education of engineering apprentices be continued for at least another year, and that the membership of this committee be increased in order that the country may be better represented from a geographical standpoint.

\*Abstract of report read before the American Electric Railway Engineering Association, Atlantic City, N. J., Oct. 9-13, 1911.

## REPORT OF THE COMMITTEE ON POWER DISTRIBUTION\*

BY A. F. HOVEY, CHAIRMAN; G. W. PALMER, VICE-CHAIRMAN;  
S. L. FOSTER, E. J. DUNNE, WILLIAM ROBERTS,  
A. S. RICHEY, S. D. SPRONG, C. R. HARTE

The committee has revised the specifications for overhead crossings and electric transmission lines since the report presented last year, and these now represent the joint report of the committees of the American Railway Engineering Association, the National Electric Light Association and the American Institute of Electrical Engineers, and have since been adopted in a joint report by the committee on high tension wire crossings of the Association of Railway Tele-



Power Distribution—Recommended Trolley Wire Sections graph Superintendents. The joint report as presented was accepted by the National Electric Light Association at its 1911 convention.

At a meeting held on March 9, the chairman assigned certain topics to the several sub-committees. These reports were discussed at meetings on May 17 and 18 and are now presented for approval.

A sub-committee on line material standardization, with a view to making interchangeable as many of the units of construction as possible, was appointed, but it was unable to present a report.

The committee wishes to report that outline drafts of specifications for the joint use of poles, specifications for overhead crossings of trolley contact wires over railway tracks and specifications for overhead crossings of foreign wires with electric railway wires have been prepared with great precision and detail and have been tentatively adopted by our committee. It has been decided that the Engineering Association should get in touch with various other associations and prepare a joint report to be submitted for adoption by our association. We have been unable to bring about such joint action in time for the convention this year and suggest that such action be taken up by the 1912 committee on power distribution.

Taking up the different subjects in detail, your committee begs to submit the following:

trolley wire in sizes other than No. 0000. (b) A paper on concrete, latticed and tubular poles. (c) Definitions of cable and strand. (d) Specifications for No. 00 round hard-drawn copper trolley wire.

Section No. 3.—Specifications for overhead crossings of electric light and power transmission lines.

### SUBDIVISION (a).—RECOMMENDATION FOR STANDARD GROOVED TROLLEY WIRE IN SIZES OTHER THAN NO. 0000

The 1910 committee on standards, after recommending that the section of No. 0000 grooved trolley wire, as recommended by the 1909 committee on power distribution, be adopted as standard, recommends that the committee on power distribution consider the design of standard sections of other sizes of grooved trolley wire, all to have, if possible, the same contour of groove, so that the same hanger, or ear, could be used for all sizes. We find that the manufacturers have adopted as standard sections No. 00 and No. 000 grooved trolley wire, as shown. These sections are known as the "American standard" and have the same contour of groove as that of the No. 0000 which was adopted as standard by this Association in 1910. We know of at least one manufacturing concern which makes a hanger, or ear, which can be used with all sizes of grooved trolley wire. The only difference between other sizes of grooved trolley wire, as apparent in the illustration, is that the appendix is larger in the different sizes, the groove remaining the same.

### SUBDIVISION (b).—CONCRETE, LATTICED AND TUBULAR POLES

Your committee in presenting the following paper on "Concrete, Latticed and Tubular Poles" recognizes that the concrete pole is now becoming better understood both as to construction and placing.

Concrete has been used in cases of emergency for reinforcing wooden poles, and tubular poles may also be protected by concrete or cement foundations that will give them great stability.

The committee is indebted to Gillette's Hand Book for the pole cost and construction data, which are here presented in tabular form. For sake of comparison, the cost of cedar poles has been added to the table; these costs include poles, unloading, dressing, gaining, roofing, boring, hauling and setting.

The Fort Wayne & Wabash Valley Traction Company has made reinforced concrete trolley poles and transmission line poles, the cost of which was as follows in 1906:

The trolley poles are 32 ft. long, 8 ft. of which is below the ground level. The pole is 10 in. square at the ground level and 6 in. at the top, and is reinforced with 8 twisted 3/8 in. steel rods. It contains 22 1/2 cu. ft. of 1:3:3 gravel concrete, and 122 lb. of steel, weighs 3,300 lb., and costs \$7.50

TABLE A—COMPARATIVE COST OF REINFORCED CONCRETE AND CEDAR POLES

Length Ft.	CONCRETE POLES									CEDAR POLES—COST			
	Top In.	Bottom In.	Size steel in.	Cubic ft. conc.	Cost of steel	Cost of conc.	Cost of bind W.	Labor	Total cost	Top in.	F. O. B. cars	Labor	Total
25	6	10	1 4	16	\$1 57 1/2	\$2 24	\$1 20	\$1 70	\$6 71 1/2	7	\$2 60	\$1 50	\$4 10
30	6	11	3 8	21	2 29	2 94	1 20	2 20	8 63	7	6 25	2 00	8 25
35	6	12	1 2	26	3 91 1/2	3 64	1 20	2 70	11 45 1/2	7	8 75	2 40	11 15
40	7	15	5 8	36	6 31	5 04	1 50	4 20	17 05 1/2	8	12 00	3 50	15 50
45	7	16	7 8	43	8 56	6 02	1 50	5 70	21 78	8	17 20	5 00	22 20
50	7	17	7 8	50	9 50	7 00	1 80	7 20	25 50	8	20 20	6 50	26 70
55	7	18	1	56	13 34	7 84	1 80	8 95	31 93	8	24 80	8 50	33 30
60	7	19	1	61	14 56	8 54	1 80	11 70	36 60	8	29 75	10 00	39 75

Section No. 1.—(a) Specifications for high tension, three conductor, paper insulated, lead covered cables. (b) Specifications for single conductor, paper insulated, lead covered cable for 1,200 volts. (c) Specifications for 30 per cent Para rubber compound.

[These specifications are too comprehensive for inclusion here.—Editors.]

Section No. 2.—(a) Recommendations for standard grooved

at the gravel pit. The transmission pole is 42 ft. long, 8 ft. being underground. It is 12 in. square at the ground level and 6 in. at the top, and is reinforced with eight twisted steel bars (1/2 in.), four of which are 32 ft. long and four are 42 ft. long. It contains 29 cu. ft. concrete, 242 lb. reinforcing bars and 21 lb. of steps, weighs 4,400 lb. and costs \$13.

### COMPARATIVE STRENGTH TESTS OF CONCRETE AND CEDAR POLES

In 1906 two forms of reinforced concrete poles were tested in comparison with two 30-ft. selected cedar poles for G. A. Cellar, superintendent of telegraph, Pennsylvania Lines West

\*Abstract of report read before the American Electric Railway Engineering Association, Atlantic City, N. J., Oct. 9 to 13.

of Pittsburgh. The concrete poles were made and the tests conducted by Mr. Robert A. Cummings, of Pittsburgh, Pa. Both poles were 8 in. in diameter at the top and 13 in. in diameter at the base, and both poles were molded hollow, with shells from  $1\frac{3}{4}$  in. to 3 in. thick, for about two-thirds of their height and solid for the rest of the height. One pole was octagonal in section and one was square in section with chamfered corners. Each pole weighed approximately 3,500 lb. Both poles were designed to carry 50 wires each coated with ice enough to make it 1 in. in diameter, and to resist a wind load of 30 lb. per square foot. The poles were assumed to stand 100 ft. apart and were made 30 ft. high. These conditions are approximately equivalent to a concentrated load of 1,000 lb. applied near the top of the pole. The reinforcement for both poles consisted of a peripheral ring of eight 24-ft. bars of round steel and alternately  $\frac{3}{4}$  in. and  $\frac{5}{8}$  in. in diameter. Wooden blocks were molded into the poles for attaching clips and braces and through holes cored for cross-arm bolts. Both the wooden and the concrete poles were set approximately 5 ft. in 3-ft. by 3-ft. by 5-ft. concrete bases. The tests showed deflections at the top before breakage of 25 in. (load 3,150 lb.) for octagonal concrete, 39 in. (load 3,690 lb.) for square concrete and 66 in. and 47 in. (loads 3,494 lb. and 2,530 lb. respectively) for wooden poles.

The report of this committee includes an abstract from a paper by George Gibbs, entitled "The New York Tunnel Extension of the Pennsylvania Railroad," describing a concrete pole line built by this road across the Hackensack Meadows. This article was presented in the *ELECTRIC RAILWAY JOURNAL* for June 10, 1911, page 1014.

#### SUBDIVISION (C).—DEFINITIONS OF "CABLE" AND "STRAND"

The committee offers the following definitions as representing the terms "cable" and "strand" as they are commonly used by the electric railway operating engineer:

A cable, from an electrical standpoint, may be defined either as one stranded conductor, or a group of conductors, either solid or stranded, assembled as a mechanical unit.

**NOTE:** This definition would exclude a solid wire insulated and lead covered, which is now commonly called a cable. The trolley wire, for instance, would fall under this definition, which is manifestly improper.

A conductor is either a solid wire or group of wires assembled symmetrically as a unit.

A strand is an individual wire of a group of symmetrically assembled wires which form a conductor.

Your committee has taken up the matter of a standard stranding table for all sizes of cable, and is awaiting the standards committee of the American Institute of Electrical Engineers, which is to draft during this year a standard table for stranding. We have, however, added a stranding table to our 1,200 volts and high-tension cable specifications for sizes generally used on this type of cable.

#### SPECIFICATIONS

The report of this committee contains detail specifications for No. 00 round-drawn hard copper trolley wire, specifications for overhead crossings of electric light and power lines which present the general requirements and conditions surrounding location, clearance, conductors, loads, factors of safety, insulation, materials, including structural steel foundations and working unit stresses for structural steel rivets, pins, bolts and wires and cables of standard sizes.

Appendix A of the report includes a table showing the strength and loading characteristics of steel wire stranded and galvanized; also for copper, aluminum and high-strength steel.

Appendix B presents tables and curves giving the sags at which conductors should be strung in order that when loaded with specified requirement of  $\frac{1}{2}$  in. of ice and a wind load of 8 lb. per square foot of projected area at zero Fahr., the tension in the conductors will not exceed the allowable value of one-half the ultimate strength of the conductors.

Appendix C is a set of specifications for galvanizing iron and steel.

Appendix D presents pole formulæ including determination of the strength of a pole, a consideration of forces acting transversely on a pole and the moment at the ground due to wind pressure on the wires, which formulæ are illustrated by examples. The report concludes with Appendix E, containing a list of the committees on overhead line construction, power distribution, high tension and electricity of the National Electrical and Railway Associations.

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## WESTINGHOUSE TRACTION BRAKE COMPANY EXHIBIT

The Westinghouse Traction Brake Company has on exhibit a rack demonstrating ten cars of electro-pneumatic brakes as applied to all subway cars of the Interborough Rapid Transit Company, New York. With this equipment the safety and capacity of the subway was greatly increased. This equipment is considered to be the most flexible, most easily controlled and most powerful braking apparatus ever installed in electric traction service. It comprises a complete automatic brake with many new features and with electric control superimposed. Thus all the power of compressed air is assured with a rapidity obtainable only with electrical transmission. In connection with this rack are two illuminated charts, electrically operated, which show graphically by curves comparative stops made by two trains, one having the old automatic brake equipment, the other the new electro-pneumatic brake equipment. The latter shows greater flexibility, reduction in time required to make stop and shortening of the stopping distance by one-half. Both service and emergency stops are demonstrated by these illuminated charts.

A rack demonstrating five cars of AMM brake equipment, electrically operated air signal system, also with the combined automatic and straight air feature, is included in this exhibit. The features of the AMM brake equipment are quick service, quick recharge, graduated release, high pressure emergency and high speed brake features for one to five-car train service.

The air signal system provides means for signaling motormen from any part of car or train, assuring instantaneous response of whistles and absolute precision as to the number or length of blasts. This apparatus is for trains of any length.

A two-car rack demonstrates the SME brake equipment, which is a straight air brake with emergency feature for single car and intermittent trailer car service. A display of electric compressor governors to meet various conditions of electric traction service is also included.

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## OBSTACLE GOLF

The golf committee has provided an ingenious and picturesque obstacle golf course on the lawn between the Marlborough and Blenheim hotels. The course consists of nine holes and is bunkered to please the eye and harrow the soul of the novice, and will give the expert plenty of food for thought. Mr. Fassett, of Albany, was on the course at the break of day with W. E. Berry. Everyone who has ever played golf, or hasn't, is expected to play and members of the golf committee will be on the course in attendance during the hours prescribed, when clubs and balls will be provided.

All ladies and gentlemen wearing the convention official badge are cordially invited to contest for the prizes offered by the committee for the lowest score. Nate Garland, costumed in flannel trousers and blue coat, is himself an attraction on the course.

## THE GENERAL ELECTRIC EXHIBIT

The General Electric Company's exhibit is in building No. 1, spaces Nos. 25-38. One of the most interesting features is a GE-203 self-ventilating commutating-pole railway motor. This is a box-frame motor of exceptionally light weight due to the use of high-grade materials and refinements in design. It is rated 40 hp on 500 volts and 50 hp on 600 volts. It weighs only 2100 lb. complete—750 lb. less than other standard motors of the same capacity. The GE-201 motor is of like design, but is rated at 50 hp on 500 volts and 60 hp on 600 volts. The GE-219 motor is a standard split-frame commutating-pole type of motor rated at 40 hp on 500 volts and 50 hp on 600 volts. The GE-217 motor is a 50 hp, 600-1200-volt box-frame type of motor with commutating poles. It is insulated for operation two in series on 1200-volt circuits.

The CP-27 portable air compressor set for use in power houses, railway shops, etc., is shown in operation. A Sprague General Electric type M control equipment, designed for the control of four 60-hp motors, is also exhibited in operation. A novel feature is the mounting of contactor, overload relay and reverser in one box.

The straight-air brake equipment shown has a CP-27 air compressor, quick-service valve, one SF4 slide type of motorman's valve on one end, and one type 3, form G, lift type of motorman's valve on the other end of the equipment; also the new type ML air compressor governor which operates like the MC form B governor. This new governor has levers made from steel punchings sherardized to prevent corrosion.

The controllers include the K-35, which is standard for the control of four 50-hp motors, and the similar K-44, recently designed for four 100-hp motors. These controllers have magnetic blowouts on each finger. The commutator grooving machine exhibited can be either motor-driven or belt-driven. It is quickly adjustable for any type of railway motor armature. The exhibit of gears and pinions includes forged solid gears, either armorized or oil-tempered, which are now available for the first time. A recording and indicating steam flow meter in actual operation measures the output of the boilers on the pier. Many railway supplies are mounted on boards, such as rail bonds, sherardized line material, circuit breakers, fuse boxes, etc. A salt-water spray test demonstrates the non-corrosive character of sherardized metal. Other exhibits embrace a luminous arc headlight; transformer oil dryer and purifier which removes water, solid matter, slime, etc., from transformer oil; ozonator in operation for deodorizing and sterilizing the air of waiting rooms, office buildings, halls, etc.; d.c. aluminum-cell lightning arresters for both 600-volt and 1200-volt circuits; mercury-arc rectifier, oscillating fan type motor, and standard 35-kw high-pressure turbine unit in operation.

There will also be exhibited on the Mississippi Avenue track a 70-ft. gas-electric car, equipped with a 200-hp gasoline engine driving a direct-connected generator which furnishes current for two No. 205 (100-hp) standard railway motors. This car will develop a speed of 60 m. p. h. on a level track. It is particularly adapted for the temporary equipment of street railway extensions, as it may be equipped with overhead trolley and run directly into a city terminal as an electric car. Several cars are being operated in this manner by the Minneapolis, St. Paul, Rochester & Dubuque Railroad.

## WESTERN ELECTRIC COMPANY'S EXHIBIT

The Western Electric Company, which occupies booth No. 240, shows a complete line of telephone train-dispatching equipment and electric railway supplies. The telephone equipment consists of a complete train-dispatching circuit in operation, all types of telephones, selectors, transmitters and receivers, drainage and repeating coils, the new No. 62-A interrupter and a "Blue Bell" battery, designed espe-

cially for electric railway service. A new transmitter arm, known as the "Rotophone," is exhibited for the first time. The supply section of the exhibit contains a full line of overhead line material, electrose third-rail insulators, Shelby seamless steel trolley poles, Kalamazoo trolley wheels and harps, M-B trolley harps, M-B sand-boxes, etc. The company is represented by F. D. Killion, M. A. Oberlander, E. D. Hinman, J. C. Enders, R. H. Harper, J. C. Maxon, G. K. Heyer, R. F. Spamer, C. V. Jellison and H. F. Miller, of New York; J. L. Ludwig, A. L. Hallstrom, J. R. Stroud, L. C. Collier and G. Sigg, of Philadelphia; W. R. Lyall, of Boston; H. C. Owen, of Pittsburgh; J. F. Davis, of Chicago, and C. E. Robertson, of St. Louis.

## H. W. JOHNS-MANVILLE COMPANY'S EXHIBIT

Among the many J-M railway products exhibited by the H. W. Johns-Manville Company the following are especially worthy of note:

J-M fiber conduit, which is manufactured in two styles, known as the bell joint and straight joint type, together with a line of fittings consisting of elbows, tees, crosses, junction boxes, etc. This material is being largely used for underground systems of distribution in preference to tile or stone conduit. Its dielectric strength is very high and it provides a protecting medium against electrolysis. It also protects the cable sheath from abrasion in pulling through the ducts. The joints can be made watertight and gasproof.

Some interesting specimens of J-M Transite ebony asbestos wood are also displayed. This material is employed for switchboard panel, high-tension switch tops, air switch and fuse bases, for barriers, etc. Samples of J-M Transite asbestos wood for fireproofing cars and power houses, etc., are also shown.

"Noark" car fuse boxes in various sizes occupy a prominent place in the exhibition, and a complete line of "Noark" National Electrical Code standard protective devices such as fuses, cutouts, service switches and fuse boxes are also well represented. A soldering paste called "Solder-all," which combines solder and a non-corrosive flux contained in a collapsible tube, was also shown along with J-M friction tapes and splicing compounds.

## RAPID CONSTRUCTION OF LARGE CARS

On Sept. 20 the St. Louis Car Company delivered to the Illinois Traction System twelve large interurban cars, the order for which cars, including trucks, had been placed but eighty-four working days previous. The character of the workmanship on these rapidly built cars is shown by one of them which is on exhibition on the Boardwalk at the corner of the Convention Pier. The new cars conform to the standard body design of the Illinois Traction System. The bodies are 57 ft. long and 9 ft. 6 in. wide over sheathing. The height from bottom of sill to top of roof is 9 ft. 5 in. and the truck-center distance is 32 ft. 3 in. The cars are equipped with the Illinois Traction System standard high knuckle and M. C. B. type coupler mounted radially under a heavy end-sill construction, which carries a section of the Hedley anticlimber. End doors provide for train operation. The cars are not equipped with motors, but are of such design that motors can be applied when required. They are intended for long-distance interurban trailer service on the lines in Illinois. The complete weight of a fully equipped car with trucks but without motors is 72,000 lb. and the requirements of the M. C. B. Association are met in the grabhandles, sill steps, etc. The bodies have arch roofs and are provided with automatic ventilators. The exhibition at Atlantic City of one of these new cars by the St. Louis Car Company was made possible through the courtesy of H. E. Chubbuck, vice-president executive of the Illinois Traction System.

## Among the Exhibits

Flood & Conklin, Newark, N. J., have taken space 258-260 to show the Simplex system of varnishes and surfacers. The representatives are H. J. Kuhn and L. A. Williams.

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Those who are interested in high tension d. c. traction should visit the Ohio Brass Company's quarters, where the 1500-volt catenary equipment of the Piedmont Traction Company is displayed.

\* \* \*

The Tool Steel Gear & Pinion Company is exhibiting quite a novelty in "Grandpa," the first forged rolled gear commercially marketed for traction purposes. It also has a number of gears and pinions with very extraordinary mileage records. This is the company's first exhibit at the convention.

\* \* \*

Flood Concrete Tie Company, Bridgeport, Conn., exhibits for the first time. It is showing reinforced concrete ties for steam and electric railway service and insulated concrete ties. The method of fastening the rail to these ties is also shown by various ingenious devices. Represented by John H. Flood, L. E. Youngs and Webster W. Dorrs.

\* \* \*

American Mason Safety Tread Company, Boston, Mass., is using space 401, Building 3, to exhibit Mason safety treads of all types for rolling stock, subway and elevated stairs and platforms, power and passenger stations. Sectional samples of Karbolith flooring in various colors are also displayed. Representatives are Henry C. King and L. H. Myrick.

\* \* \*

The Golden-Anderson Valve Specialty Company, Pittsburgh, Pa., has received an order from the United States Steel Corporation for 970 cushioned triple-acting and non-return valves for its power stations. This is believed to be the largest requisition for valves ever placed with a single manufacturer at one time. The order was given only after a most searching test of the several designs on the market.

\* \* \*

Archbold-Brady Company, Syracuse, N. Y., is distributing at its space 402 a handsomely illustrated bulletin which shows applications of its steel transmission structures and catenary bridges on several prominent installations. These include poles, towers and bridges for the Hoosac Tunnel single-phase electrification of the Boston & Maine Railroad and catenary bridges for the Beebe syndicate's interurban lines in Central New York.

\* \* \*

Joseph Dixon Crucible Company, Jersey City, N. J., has an elaborate exhibit of its various products in space 19, Building 1, consisting of graphite wood grease, silica-graphite paint, graphite lubricants of all kinds, crucibles, graphite dynamo and motor brushes, belt dressings and Dixon pencils. Some excellent photographs of steel structures preserved by Dixon silica-graphite paint are also displayed. Represented by L. H. Snyder, H. W. Chase and J. M. Willetts.

\* \* \*

The Taylor stoker can be seen in operation at booths Nos. 53-55. This is a complete installation, including undergrate draft fan and engine, brickwork, air ducts, piping, etc., just as it would appear in a power plant. The engine, which with this type of stoker drives both fan and stoker mechanism, operates the stoker rams, but it is not necessary to operate the fan, as there is no feeding of coal. The absence of coal, ashes and the intense heat accompanying actual operation permits a thorough examination of the stoker.

The National Tube Company is showing at spaces 354-357 the Shelby cold-drawn seamless steel trolley pole. In making this pole no heat is applied during the processes of manufacture after the first cold drawing. Its strength is therefore uniform throughout, as it would not be if heat was used in tapering the end of the pole. This pole was made to meet the present requirements of high-speed service, which demand a trolley pole which will not fail while moving through a wide angle of varying positions.

\* \* \*

Consolidated Car Fender Company, Providence, R. I., has spaces 276, 278 for a demonstrating exhibit of "Providence" fenders and wheel guards. The wheel guards can be operated in one or all of three ways, by the foot of the motorman, by apron or by an automatic attachment to the air brake. The last-named device operates automatically when the air brakes are applied in an emergency, the wheel guard dropping as soon as the air pressure reaches or exceeds a certain point. The company also shows miniatures of the Campbell snow broom and Narragansett steel lockers. Representatives are A. J. Thornley, general manager, and George Hollingsworth.

\* \* \*

D & W Fuse Company, Providence, R. I., is using space 236 for an exhibit of inclosed fuses and cut-outs for 250-volt, 600-volt and 2500-volt circuits, including fuse and service switch boxes, entrance railway and transformer and junction cut-outs. In addition to the fuse line will be found a variety of sizes of deltaboston magnet wire, in round, flat and square sections; also delta-tape delto-sheeting varnishes and compounds. Field and armature coils are also displayed, together with a line of magnetic chucks, both flat and rotary types, for planers, grinding and milling machines. Representatives are W. S. Sisson, H. F. MacGuyer and H. P. Hinds.

\* \* \*

Goldschmidt Thermit Company, New York, N. Y., has an interesting exhibit which embraces a moving picture outfit illustrating the various steps in the thermit welding of locomotive frames and rail welding. These views prove the quickness and simplicity of the thermit system. The exhibit is complete with the materials and appliances for welding rails, including crucibles, thermit, molds, patterns, preheating appliances, rail grinder, metals and alloys produced free from carbon by the thermit process. Materials for welding tubes and pipes and samples of all kinds of welding with thermit are also shown. The company is represented by its general manager, William C. Cuntz; L. Heynemann, G. E. Pellissier, H. S. Mann and J. G. McCarty.

\* \* \*

The Ohmer Fare Register Company is exhibiting at booth No. 200 its new combination turnstile and register, which has an auxiliary indicator to enable the passenger to see the amount of fare paid by him. A second novelty is the "Rapid Transit" operating equipment, which registers any one of six classes of fare as fast as a one-fare machine could be operated. A third exhibit is a detail and total cash register for city work, which totalizes and prints separately in dollars and cents each class of fare, and also prints a detail record of the ticket collections. A fourth exhibit is a stop or station indicator and accident-prevention device for interurban cars to indicate the next approaching stop to the passengers. This machine records the meeting points, the train numbers, trip number and time. The record is made by the motorman from his cab. It is believed that the performance of some physical act after the passing of each stop or meeting point will prove an incentive toward reducing the liability to head-on collisions. The company is also showing a register for registering and recording sixty different classes of fare.

Walter Chur, of the American Railway Supply Company, New York, N. Y., in space 403, has a neatly arranged exhibit of cap and breast badges for trolley employees, buttons, checks and other products manufactured by the company.

\* \* \*

Le Valley Vitae Carbon Brush Company, New York, N. Y., has a full line of carbon brushes in space 208 with James H. Denton & Company. The company is represented by its general manager, M. W. Robertson, J. H. Denton and J. E. Coonan.

\* \* \*

Ellcon Company, New York, N. Y., is displaying in space 333, Building 3, Ellcon conduit fittings, metal car signs and racks, air brake and control circuit interlocks and automatic overload stop for electric controllers. Represented by W. R. Hamilton and Butler Keys.

\* \* \*

H. K. B. Manufacturing Company, Newark, N. J., located at space 803C, Aquarium Court, is a newcomer at the convention. Charles F. Beers, secretary and treasurer of the company, is showing in operation a model of an automatic centrifugal journal oiler, a method of journal lubrication not now in use.

\* \* \*

G. Drouvé Company, Bridgeport, Conn., has space 170, Aquarium Court, where it is exhibiting Anti-Pluvius puttless skylights for repair shops and carhouses, and working full-size straight-push sash operating devices for controlling long lines of sash from one point. William V. Dee is representing the company.

\* \* \*

A notable part of the exhibit of the Whipple Supply Company, New York, is a large framed schedule of the number of railways which have equipped some or all of their cars with the Hedley anti-chamber. There are forty-nine roads and a total of 5719 cars. Besides the anti-chamber displayed in the booth of this company, are Universal safety treads and tool steel gears and pinions. The company is represented by A. L. Whipple and H. F. Stevenson.

\* \* \*

James H. Denton & Company, New York, N. Y., has space 208, Building 2, where it is displaying a well-arranged exhibit of carbon brushes, commutators, armature and field coils, steel castings, commutator truing devices, and C-A wood-preserved. The Hartford-Blanchard valve-grinding machine is an especially interesting part of the exhibit to engineers who know the difficulty of grinding air brake valves. The company is represented by J. H. Denton and J. E. Coonan.

\* \* \*

W. J. Jeandron, New York, N. Y., sole agent for the United States of the well-known Le Carbone brushes, is showing them at space 220, Building 2. In neat cases characteristic of French workmanship are displayed every type of carbon brush that can be used in the electrical arts. It is stated that, although only four years on the market in the United States, 60 per cent of the entire electric railway mileage of the country is operated with Le Carbone brushes. W. J. Jeandron and Halsey Stein are present at the convention.

\* \* \*

Albert & J. M. Anderson Manufacturing Company, Boston, Mass., has an interesting exhibit, including an improved 6000-amp. 250-volt d.c. remote-control switch, a full line of Aetna insulating line material, trolley bases, harps and whistles, and switches of various description for 600-volt railway service. The overhead crossings and frogs of malleable iron show the latest design in this class of work. The company is represented by its president, J. M. Ander-

son; sales manager, George B. Crane; Ernst Woltman, New York; W. W. Hinchey, Chicago; J. F. Stout, Boston; A. H. Burns, Philadelphia; K. L. Curtis, Boston.

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Badger Fire Extinguisher Company, Boston, Mass., has brought something new in the shape of a fire extinguisher of one-quart capacity. This size is especially applicable to electric cars, as well as repair shops, carhouses, power houses and substations. The extinguisher is filled with carbon tetra-chloride, a volatile liquid which kills incipient fires. There is also exhibited a 40-gal. chemical engine for shops, carhouses and other buildings, a 40-gal. truck type chemical engine for outside use, a 3-gal. hand chemical extinguisher for general use, also a 1½-gal. hand chemical fire extinguisher. The company is represented by Charles R. Edwards and A. E. Stone.

\* \* \*

Blake Signal & Manufacturing Company, Boston, Mass., has a working exhibit of its standard signal apparatus, consisting of dispatching office equipment and five signals. Three of these signals are d. c. electric railway type and two of the signals are a. c. electric railway and steam railway type. One of the latter type is mounted on a new standard steel pole with fittings. This pole shows the below-ground foundation and arrangement for keeping it rigid. It illustrates the installation which was made during the past year on the lines of the Illinois Traction System. There are also shown the various low-voltage telephone and telegraph wiring specialties, soldering flux, etc., manufactured by the company. The company is represented by its president, E. J. Burke; vice-president, C. C. Blake, and G. H. McFee.

\* \* \*

Automatic Ventilator Company, New York, N. Y., is in space 226, Marine Hall, where it is exhibiting all types of its automatic car ventilators. Demonstrations of how the ventilator operates in service are made. For this purpose a full-sized model, representing a section of the clerestory of a car with two sets of automatic ventilators in the deck sash, is shown. An electric fan at one end of the model throws air along the side to simulate conditions in a moving car, and to show the intake and exhaust principle of automatic ventilation. Tests and demonstrations with an anemometer, lighted tapers, pieces of paper, silk, etc., are also made inside of the model to illustrate the principles of the ventilator. Demonstrating models are displayed to show how the smoke and foul air can be exhausted from a moving car. The ventilators can be installed on any type of roof now in service. Representatives present are George H. Ford, W. J. Flemming, Jr., Leonard J. Hibbard, Frank A. Barbey and E. V. Smith, of Eccles & Smith, San Francisco.

\* \* \*

The American Automatic Switch Company, New York, N. Y., is exhibiting at space 220 a track circuit counting signal and the new type-15 electric track switch. The track circuit counting signal counts a certain number of cars into a block as they enter the block and counts them out again as they leave the block. The signal is novel, in that no contactors are used on the trolley wire and the counting in and all functions of safety are accomplished by gravity. Breaking of wires or grounds cannot give the clear signal at the wrong time. The signal is for operation on either the light signal or the semaphore type similar to those now being installed on the lines of the Public Service Railway and those in use on the Long Island Railroad. The type-15 electric track switch is the new design which entirely eliminates the relay box. It has a contactor which allows the trolley wheel to run on the wire, thus making a very smooth riding path for the trolley wheel. No wood is used in the construction of the contactor, thereby eliminating any danger of burning the contactor from arcing. Represented by Roy Collins, R. Sanger, D. Polderman, H. A. Goode.



Johns-Pratt Company, Hartford, Conn., is represented at the convention by its president, E. B. Hatch.

\* \* \*

C. W. Hunt Company, New York, N. Y., has an interesting exhibit at spaces 150-156 of industrial tracks and cars, valves, coal and ash handling machinery, bucket conveyors, and photographs of power plants equipped with its machinery. Represented by J. Day Flack, Joseph P. Maxwell and Andrew J. Summers.

\* \* \*

Jenkins Brothers, New York, N. Y., have an exhibit of varied interest in spaces 134-136, consisting of high-pressure steel globe and gate valves, brass and iron valves for power houses and all styles of packing for steam joints. Water gages and other power house specialties are also shown. The representatives are W. S. Corcoran, Frank Martin and C. B. Yardley, Jr.

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Bonney-Vehslage Tool Company, New York, N. Y., has a neat exhibit in Machinery Hall consisting of a case in which are shown forty-five styles of ticket punches, each punch with a different die. Both male and female dies are made of carbon steel. A sleet cutter which can be applied without tools and operates automatically is also shown. The representatives are E. C. Vehslage and Frank Kennedy.

\* \* \*

Electric Railway Improvement Company, Cleveland, Ohio, has spaces 386, 388, 389 for working demonstrations of its electric welding system. Sample welded rail bonds are also exhibited in large number, showing the application of this method to different types of rail sections, rail weights and bonds. Representatives are E. E. Schmid, Gerald Howatt, C. D. Shoup, W. E. Huber.

\* \* \*

Hunter Illuminated Car Sign Company, Flushing, N. Y., is at space 44, where it is exhibiting a partial model of a car equipped with the various types of illuminated signs which it manufactures. A contract has recently been signed by this company with the Boston Elevated Railway to equip its entire system in Boston with Hunter illuminated signs. The same thing is true of Philadelphia, Pa., and Detroit, Mich. The president of the company, Lytle J. Hunter, and its superintendent, Harry Reisiger, are at the convention.

\* \* \*

Van Dorn & Dutton Company, Cleveland, Ohio, has space 132, where it is exhibiting electrically operated drills and reamers for both a. c. and d. c. circuits; all sizes of solid and split railway motor gears and pinions; automobile gears, cam and pump gears, worms and sectors for steering devices, miter gears, racks, ratchet gears, rawhide and fiber gears, etc. Representatives are Fred Zulauf, assistant sales manager; A. K. Baxter, sales department; G. Neubecker, gear department.

\* \* \*

Lord Manufacturing Company, New York, is showing a working model of the Spencer air-purifying system, which eliminates sand, dust and dirt from air before it enters the air-brake piping. All of the other electric railway specialties manufactured by this company are also on exhibition, such as Earll retrievers and catchers, the con-tro-la-tor, Shaw lightning arrester, M. V. G. lightning arresters and Luminator flaming-arc lamps for series lighting. The company is represented by W. R. Garton, A. V. Arnold, G. Lehmann and G. M. Spencer.

\* \* \*

The J. G. Brill Company, Philadelphia, Pa., has commenced delivery of thirty all-steel cars for the Market Street elevated subway system of Philadelphia, Pa. The cars are about 50 ft. over all and are mounted on Brill No. 27 M.C.B.-3 trucks. Delivery of the cars began and will be

completed within the early delivery date which was specified in the contract. This order shows the prominent part that the Brill Company is taking in steel car work. The body of the all-steel gas-electric car which the General Electric Company is showing along the Boardwalk is one of four similar cars built by the Wason plant of The J. G. Brill Company.

\* \* \*

J. J. McCabe, New York, N. Y., has on exhibition and in operation in Machinery Hall his "2-in-1" double-spindle lathe, designed for street railway repair shops. This machine is unique in its range of usefulness, for it will handle advantageously anything that comes along, large or small. Mr. McCabe is showing the lathe in operation turning and truing up old car wheels with a triple-gear 48-in. swing which is geared 72 to 1. The lathe is interchangeable to a 26-in. back-gear lathe. On this size axles are finished, commutators bored out, armatures trued up, piston-rings faced, etc. In fact, this one lathe can do almost any class electric railway repair work necessary. On Monday the large size lathe was in operation. On Tuesday the small size lathe will be in use, the large size again on Wednesday, etc. All parts of this lathe are interchangeable. The staff of salesmen at the exhibit includes Harry P. McCabe, Frank Sheeran, George L. Bennett and others. The machinists demonstrating the lathe in operation are Fred Kompass and W. Priestley.

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Railway Roller Bearing Company, Syracuse, N. Y., is exhibiting at spaces 113-115, Machinery Hall, roller-bearing journal boxes of various sizes from Baldwin electric locomotive journals, Brill and other standard truck journals to light storage battery car journals; also a Rollway car wheel operating on a fixed axle similar to those installed on double truck Beach-Edison storage battery cars. There are also exhibited Rollway bearing detachable hubs; G-E 216 railway motor equipped with Rollway bearing frame heads; Rollway bearing journal boxes which have been operated for continuous service for two years on the cars of the Philadelphia Rapid Transit Company; Rollway bearing parts, end shields, etc. During the past month orders were received from Paris, France, for Rollway journals; also for Rollway frame heads for the French Thomson-Houston railway motors. Rollway journal boxes are also being made for preliminary installation on London surface cars. An order has also been secured from the Chicago & Northwestern Railway for Rollway journals for electric train service. Represented by James N. Vandegrift, R. H. Carhart, John Hulbert, H. L. Aberdeen.

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Whitmore Manufacturing Company, Cleveland, Ohio, is attracting attention to its exhibit at spaces 162-164-164A by means of an elaborate electric sign which represents a gear and pinion operated by a flasher so that a vivid representation of motion is produced. The exhibit includes gears and pinions which have been in active service on city and inter-urban lines. Among these is a gear and pinion from the Schenectady (N. Y.) Railway which is on exhibit this year for the third time, having been shown at Denver two years ago and Atlantic City last year. In each case it was returned after the convention and placed in service again. The total mileage to date is 142,825 miles, and the period of active service two years, nine months and twenty-four days. The pitch line on the pinion is still preserved. There is also a gear and pinion from the Spokane & Inland Empire Railroad, showing a mileage of 194,700 miles and in service three years, one month and twenty-six days. The company is represented by S. W. Whitmore, William Beaser, Jr., and Henry Stuckenholt. R. R. Herzog, of Whitmore Products Sales Company, Chicago, Western distributor for the Whitmore products is also present.

Pressed Prism Plate Glass Company, Pittsburgh, Pa., has an exhibit in space 191, of its ornamental and plate glass for rolling stock equipment. This is the first national electric railway convention at which this company has exhibited. Representatives are A. O. Brown, L. R. Waterman.

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W. H. Coe Manufacturing Company, Providence, R. I., is demonstrating gilding wheels; ribbon gold and silver leaf made in widths from 1-16 in. to 5 in.; bronzing powders and Hibrush bronzing liquid, at space 181. Benjamin A. Smith, Eastern representative, is in charge.

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Cheatham Electric Switching Device Company, Louisville, Ky., is using spaces 157 to 163 for a showing of its automatic track switch for electric railways. The company is represented by J. A. Stewart, president; Elmer S. Olmsted, vice-president and electrical engineer, and Samuel Bowman, general agent.

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The Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has space 345, where it is again exhibiting its dispatchers' selective signal system for railways. Two large installations of this apparatus have just been made. The iron-clad and portable railway telephones are still in evidence, as are the well-known magneto telephones and switchboards, portable test sets and loud-ringing extension bells.

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Taylor Stoker Company, Providence, R. I., displays at spaces 153, 155, a two-retort stoker, one No. 9 Multivane fan and a No. 66 vertical steam engine, which are connected together and in operation. The stoker pressure regulator is made by the Mason Regulator Company and the firebrick is special high-temperature brick from the Harbison-Walker Company. Two demonstrations of the workings of the stoker will be given each day. Representatives, M. Alpern, J. F. Mallory, W. I. Bowden.

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Samson Cordage Works, Boston, Mass., have a handsome exhibit of Samson spot trolley cord and Samson signal cord at space 313. The central feature is a large green and gilt board, displaying flat coils of various colors and sizes of cord used for trolley and signal cord. The booth also contains a pile of full coils of different kinds of cord, and a table with samples, circulars, souvenir pencils, etc. Represented by F. J. Coakley, secretary; R. G. Whiting, W. G. Webb, W. G. Woodworth

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Dayton Fare Recorder Company, Dayton, Ohio, is exhibiting in spaces 280, 281 full-size car sections showing the regular double-end pay-as-you-enter equipment and the single-end prepayment type complete with operating equipments of fare recorders, register rods and auxiliary devices. This fare recorder produces an audited trip sheet. Will I. Ohmer, president, and A. G. Mitten, vice-president and general manager, are in attendance with a corps of demonstrators. The company also has a full working equipment in Brill car No. 1911, on the Boardwalk.

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Lord Electric Company, New York, N. Y., is showing a working model of the Spencer air purifying system which eliminates sand, dust and dirt from air before it enters the air brake piping. All of the other electric railway specialties manufactured by this company are also on exhibition such as Earll retrievers and catchers, the con-tro-la-tor, Shaw lightning arrester, M. V. G. lightning arresters and Luminator flaming arc lamps for series lighting. The company is represented by W. R. Garton, A. V. Arnold, G. Lehmann and G. M. Spencer.

The Universal Lubricating Company (TULC), Cleveland, Ohio, has space 167, Aquarium Court, where it is showing various forms of "Tule" lubricant and waste. No. 2-H is the plain, solidified oil for impregnating or renewing No. 2-WW, the company's wool waste for bearings with small feed slots, and No. 2 yarn for bearings with large feed slots. This lubricant is serviceable at all temperatures, as it withstands 340 deg. Fahr. without melting and 40 deg. Fahr. below zero without hardening. Representatives present are Charles H. Clark, president; S. W. Scofield, secretary and treasurer; T. U. Franklin, general sales manager.

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United States Electric Signal Company, West Newton, Mass., has spaces 157 to 163 in Machinery Hall, where it is showing interurban semaphore signals operated by a track relay; the G-1 type of non-counting signal as installed on the Public Service Railway's system; the K and K-2 counting signals, some of which are also in operation on the Public Service system; a spacing signal for double-track lines, or where cars are operated in one direction only; crossing signal with semaphore attachment and illuminated sign, the semaphore being an indication for the motorman and the light an indication for the passengers. Representatives are John J. Ruddick, Roland F. Gammons, second; W. W. Harrington, J. W. Putnam, E. S. Olmsted, James Rier.

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National Brake Company, Buffalo, N. Y., has space 262, 264, and is calling special attention to the improved Peacock brake, exhibited for the first time. About 120 of this new model are already in use on the lines of the Rhode Island Company, Providence, R. I. The exhibit includes a hand brake for steam cars, as recently installed on the Lackawanna Railroad, which was one of the first companies to adopt this type of brake. The last dining and chair cars built by the Pullman Company for the Atchison, Topeka & Santa Fé Railway are equipped with Peacock brakes. The Brill sample car shown on the Boardwalk is also equipped with Peacock brakes. Representatives are F. D. Miller, president; W. D. Brewster, secretary, and Thomas C. Boyce.

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General Railway Signal Company, Rochester, N. Y., has space 420, where it is showing a working model illustrating its absolute-permissive system of automatic block signals. The miniature signals used are in circuit with full-size G. R. S. universal signals, Model 2A, a. c. direct-connected mechanism, and Model 2A, a. c. base of mast. The company is also showing devices such as reactance bonds, semaphores, relays, light signal, switch box, signal transformers, switch indicators, etc. The company is further exhibiting its selective system, which can be used in connection with either automatic signal systems or train-dispatching systems. G. D. Morgan, vice-president; H. M. Sperry, sales manager; W. K. Howe, chief engineer; M. F. Geer, sales engineer; W. J. Plogstead, resident engineer; Richard C. Leake, engineer and in charge of the exhibit.

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Elcon Company, New York, N. Y., is exhibiting at its space 333 the "Elcon current governor" for car controllers. This consists of an electrically operated pawl which engages a ratchet wheel on the controller drum shaft. The action of this pawl is governed by the current flowing in the motor leads. A series limit switch is placed in circuit which closes when the current reaches a predetermined value. The closing of this switch energizes a small controller coil, which in turn operates the pawl and locks the controller. As the speed of the motor increases and the current is reduced, the limit switch opens and the controller is at once released through the de-energizing of the small coil. Thus automatic acceleration is accomplished for multiple control without the complication of interlocks and intricate wiring circuits.

## List of Exhibits

- Allis-Chalmers Company, Milwaukee, Wis., spaces 21-23, Building 1. Steam turbine model, straight and automatic air-brake equipment, 40-hp and 50-hp standard railway motors, 60-hp interpole railway motor, S-3 and S-4 controllers, 150-kva self-cooled transformer, portable air compressor, section of brake cylinder showing Acco expander ring, sectional engineers' valve, sectional governor, repair parts for compressors and air-brake equipment, photographs of various apparatus and installations. Represented by F. S. Sly, C. A. Tupper, M. C. Miller, J. W. Gardner, I. L. Dimin, J. T. Cunningham, H. W. Cheney, J. W. Murray, J. C. Lynch, F. C. Randall, St. John Chilton.
- American Abrasive Metals Company, New York, space 437. Car steps with treads, floor plates, fire resistance surfaces, solid stair treads. Represented by H. W. Mowery, J. P. Warfle.
- American Brake Company, St. Louis, Mo., spaces 20-24, jointly with the Westinghouse Air Brake Company. American automatic slack adjuster. Represented by E. L. Adreon, R. E. Adreon.
- American Brake Shoe & Foundry Company, Mahwah, N. J., space 302. Brake shoes and brake heads. Represented by W. G. Pearce, W. S. McGowan, J. B. Terbell, F. W. Sargent, J. S. Thompson, E. B. Smith, F. L. Coolidge, R. M. Brower, E. L. Janes, W. L. Boyer, G. R. Law, R. E. Holt, A. H. Elliot, L. R. Dewey, T. Seaman, J. G. Tawse.
- American Mason Safety Tread Company, Boston, Mass., space 401. Safety treads, Karbolith flooring. Represented by Henry C. King, L. H. Myrick.
- American Railway Supply Company, New York, N. Y., space 403. Cap and breast badges for trolley employees, buttons, souvenirs, etc. Represented by Walter Churr.
- American Steel & Wire Company, Chicago, spaces 358-361. Rail bonds and appliances for installing electrical wires and cables; right-of-way fencing, concrete reinforcement. Represented by George A. Cragin, C. S. Knight, Jr., F. A. Keyes, R. K. Sheppard, B. H. Ryder, J. H. Ashby, C. S. Sturdevant.
- Anderson, Albert & J. M., Manufacturing Company, Boston, Mass., space 221. Aetna insulation line material, trolley bases, harps and wheels, switches specially adapted for 600-volt railway work, 4000-amp remote control switch, etc. Represented by Ernst Woltman, A. H. Burns, W. W. Hincer, J. F. Stout, G. B. Crane, J. M. Anderson.
- Anglo-American Varnish Company, Newark, N. J., space 186. Represented by William Marshall.
- Archbold-Brady Company, Syracuse, N. Y., space 402, Building 3. Model of catenary bridge and transmission line structure, photographs, catalogs, etc., of catenary and transmission construction. Represented by W. K. Archbold, R. L. Allen.
- Atlas Railway Supply Company, Chicago, Ill. Atlas rail joints, compromise joints, special joints and one-piece joints, tie-plates and braces. Represented by J. G. McMichael, Daniel Thomson.
- Automatic Ventilator Company, New York, N. Y., space 226, Marine Hall. Demonstrating models and samples of the "Automatic" car ventilator. Represented by George H. Ford, W. J. Fleming, Jr., Leonard J. Hibbard, Frank A. Barbey, E. V. Smith (Eccles & Smith Company).
- Badger Fire Extinguisher Company, Boston, Mass., space 183, Auditorium Court. Forty-gallon chemical engine with Underwriters' Laboratories inspection labels for carhouses, repair shops and buildings; 40-gal. truck-type chemical engines for outdoor use, yards, parks, etc.; 3-gal. hand chemical fire extinguisher for all buildings; 1½-gal. hand chemical fire extinguisher for cars, boats, etc.; a new fire extinguisher, one quart capacity, using carbon tetrachloride for power houses, cars and around all electrical works. Represented by Charles R. Edwards, A. E. Stone.
- Baldwin Locomotive Works, Philadelphia, Pa., spaces 105, 107, 109, 111. Motor truck for Greenville, Spartanburg & Anderson Railway; trailer truck for the Boston Elevated Railway and one maximum-traction motor truck for the Richmond & Henrico Electric Railway. Represented by S. A. Bullock, Wallace R. Lee, W. B. Keys.
- Bayonet Trolley Harp Company, Springfield, Ohio, space 271, Building 2. Bayonet trolley bases, trolley harps, trolley wheels, sleet cutters. Represented by R. A. Garlough, C. S. Olinger.
- Blake Signal & Manufacturing Company, Boston, Mass., space 228-230, Building 2. Dispatcher's selective semaphore signals, wiring specialties, soldering flux. Represented by E. J. Burke, C. C. Blake, G. H. McFee.
- Brill Company, The J. G., Philadelphia, Pa., spaces 1, 3, 5, 7, 9. Brill semi-convertible prepayment car mounted on No. 39-E single-motor trucks, No. 39-E single-motor truck in operation on testing platform; No. 27-M.C.B.-3 truck, for Boston Elevated Railway Company for Cambridge tunnel service; No. 27-GE-1 truck, for the Chicago Railway Company; No. 27-M.C.B.-1 truck for light interurban service; No. 21-E single trucks. City and interurban car seats; fare boxes for prepayment fare collection systems; seating materials, springs, half-ball brake hangers and other patented specialties. Represented by J. W. Rawle, W. H. Heulings, Jr., A. N. Hargrove, R. B. Liddell, W. S. Adams, S. T. Bole, G. M. Haskell, J. E. Brill, L. A. Kling, F. B. Sullivan and S. M. Wilson—all of The J. G. Brill Company; Geo. H. Tont-rup, F. W. Brill and E. Bronenkamp, American Car Company; D. B. Dean and H. E. Smith, of the G. C. Kuhlman Car Company; Henry Pearson, A. H. Pease and C. F. Rice, of the Wason Manufacturing Company; S. K. Colby, of Pierson, Roeding & Co.; F. L. Markham, Southern representative.
- Bryan & Gaskill, Newbern, N. C., space 407, Building 3. Car windows and unjammable sash holders. Represented by James A. Bryan and E. T. Gaskill.
- Cambria Steel Company, Johnstown, Pa., spaces 321-323. Coffin process and heat-treated axles, 100 per cent joints, Morrison guard rails, wire products, rails. Represented by J. Leonard Replogle, G. E. Thackray, M. G. Baker, H. P. Hubbell, Andrew Morrison, H. L. Waterman, E. F. Kenney, W. S. Ottinger.
- Carnegie Steel Company, Pittsburgh, Pa., spaces 354 to 365, Building 3. Schoen and Slick wheels, rolled steel car wheels, Slick rolled steel gear blanks, forged and heat treated axles, miscellaneous rolled sections, steel sheet piling, special welding and threading steel; pair of rolled steel wheels mounted on axles, steel hoops for slack barrel cooperage, Duquesne rail joints, steel cross ties, section of track showing steel cross ties in concrete construction, vanadium steel axles, springs and bars (a machine for making service test on vanadium steel springs is shown in space 183); spikes, track-bolts and screw spikes. Represented by Waldo E. Berry, Fred C. Denning, Park Hutchinson, W. I. Parry, L. C. Bihler, John W. Dix, I. W. Jenks, W. P. Siebert, L. H. Bowman, C. B. Friday, L. P. Lincoln, H. P. Tiemann, W. G. Clyde, G. F. Goddard, L. C. Lustenberger, N. B. Trist, Robert Coe, N. M. Hench, Norman McLeod, T. W. Williams, L. W. Conroy, J. C. C. Holding, H. W. Maxson, V. S. Yarnall.
- Cheatham Electric Switching Device Company, Louisville, Ky., spaces 157-163. Cheatham electric switching devices for operating electric railway track switches automatically. Represented by J. Adger Stewart, E. S. Olmsted, Samuel Bowman.
- Chicago Pneumatic Tool Company, Chicago, Ill., spaces 100-104. Portable electric track drills, grinders and spike drivers, pneumatic hammers, drills. Represented by Thomas Aldcorn, C. B. Coates, G. A. Barden, Edward Aplin, F. S. Eggleston, J. W. Smith.
- Chicago Varnish Company, Chicago, spaces 425, 426, Building 3. Ce-Ve painting and varnishing process. Represented by George S. Bigelow, A. C. Morgan, G. G. Porter, F. L. Olds, R. K. Buckman, F. N. Gundrum.
- Chicago Railway Equipment Company, Chicago, space 438, Building 3. Brake beams, side bearings.
- Cleveland Frog & Crossing Company, Cleveland, Ohio, space 166. Tongue switches, mates, frogs, crossings, split switches, switch stands, Kerwin portable crossover and other kinds of steam and electric railway special work. Represented by G. C. Lucas, Geo. Stanton, L. G. Parker, Geo. A. Arnold, Jr., Geo. Peabody, S. Balkwill, Wm. Schmitt.
- W. H. Coe Manufacturing Company, Providence, R. I., space 181. Gilding wheels, ribbon gold and silver leaf, bronzing powders and Hilbrush bronzing liquid. Represented by Benjamin A. Smith.
- Columbia Machine & Malleable Iron Company, Brooklyn, N. Y., space 185, Aquarium Court. Pressed-steel gear cases, pinion puller, bronze axle and armature bearings, ratchet brake handles, car trimmings, controller handles, truck forgings, trolley wheels. Represented by W. R. Kerschner, James Grady, John Kress, Jr., M. F. Ziegler.

- Consolidated Car Fender Company, Providence, R. I., spaces 276, 278. Providence car fender and Providence wheel guard. Represented by A. J. Thornley, George Hollingsworth.
- Consolidated Car-Heating Company, Albany, N. Y., spaces 376, 377, 378, 379. All-steel panel, truss-plank and cross-seat heaters; heat deflectors; switches and fuse boxes; thermostat for controlling heaters; buzzer system; battery-charging relay system and resistance tubes; door devices; air brake governor; car signal system; ventilating stove. Represented by Cornell S. Hawley, James F. McElroy, W. S. Hammond, Jr., Thomas Farmer, Jr., C. C. Nuckols, H. L. Hawley, Morgan F. McDonough.
- Cooper Heater Company, Carlisle, Pa., and Dayton, Ohio, space 223, Building 2. Pressed steel hot-water car heaters. Represented by W. L. Blackwell.
- Crouse-Hinds Company, Syracuse, N. Y., space 216, Building 2. Arc and incandescent headlights, condlets, "Harpoon" guy anchors, "Adjustarods," multiple brake switches. Represented by A. F. Hills, F. M. Hawkins, D. C. Gidley, Frank Buchanan, E. G. Smith, M. J. Kiefer.
- Curtain Supply Company, Chicago, Ill., spaces 380-382. Curtain fixtures, "Rex" all-metal roller, "Rex" steel sash balance. Represented by W. H. Forsyth, R. F. Hayes, S. W. Midgley.
- The Cutter Company, Philadelphia, space 174. Remote-control circuit breakers on exhibition, motor operated, electro-pneumatic, magnetic operated; also reverse current and time-limit circuit breakers. Represented by F. E. Beasley and T. B. Eastburn.
- E & W Fuse Company, Providence, R. I., space 236. Inclosed fuses, cut-outs and fuse and service switch boxes, entrance, railway and transformer junction cut-outs; Deltabeston magnet wire, insulating materials for coils, namely, Delta tape, Delta sheeting, varnish and compounds; completed field and armature coils; magnetic chucks, for planers, grinding and milling machines. Represented by W. S. Sisson, H. F. MacGuyer, H. P. Hinds.
- Dayton Fare Recorder Company, Dayton, Ohio, spaces 280-281. Dayton fare recorders and operating mechanisms adapted for different types prepayment cars. Represented by Will I. Ohmer, A. G. Mitten, T. G. Whistler, J. E. McAllister, E. H. Scholey.
- James H. Denton & Company, New York, space 208, Building 2. Carbon brushes, commutators, armature coils, field coils, steel castings, Hartford-Blanchard valve grinding machine, commutator truing device and C-A-Wood-Preserver. Represented by J. H. Denton, J. E. Coonan, M. W. Robertson, H. H. Gerhard.
- Dearborn Drug & Chemical Works, Chicago, Ill., booths 5-7, Building 1. Attractive reception booth. Represented by Robert W. Carr, Grant W. Spear, H. G. McConnaughey.
- Detroit Steel Products Company, Detroit, Mich., space 168. "Detroit-Fenestra" solid steel window sash, Critall case-ment windows. Represented by M. A. Beltaire, Jr.
- Joseph Dixon Crucible Company, Jersey City, N. J., space 19, Building 1. Graphite wood grease, silica-graphite paint, graphite lubricants of all kinds, crucibles, pencils, belt dressings, graphite dynamo and motor brushes. Represented by L. H. Snyder, H. W. Chase, J. M. Willitts.
- G. Drouvé Company, Bridgeport, Conn., space 170, Aquarium Court. Anti-Pluvius pnttyless steel constructed skylight for carhouses and Straight-Push sash operator for controlling long lines of sash from one point. Represented by William V. Dee.
- Duff Manufacturing Company, Pittsburgh, spaces 431, 432. Parrett track and car jacks, Barrett armature lifts, Duff ball-bearing screw jacks and Duff-Bethlehem hydraulic jacks. Represented by E. A. Johnson, F. O. Graham, T. A. McGinley.
- Eclipse Railway Supply Company, Cleveland, Ohio, spaces 265, 267. Eclipse fender, Acme fender, Eclipse multiple wheelguard. Represented by Joseph Foster, Jr., Ross Forward.
- O. M. Edwards Company, Syracuse, N. Y., spaces 325, 327, 329, 331. Window fixtures, metal trap-doors, all-metal shade rollers, steel filing devices and office furniture. Represented by O. M. Edwards, E. W. Edwards, second, Edward F. Chaffee, G. G. Norris, W. E. LeBrun, T. P. O'Brian, C. H. Rockwell, W. C. Bradbury.
- Electric Railway Equipment Company, Cincinnati, Ohio, space 419. Overhead line material, tubular poles, pole fittings, electric lighting poles, boulevard posts, mining material, catenary material. Represented by A. L. Johnston, J. G. Kipp, William A. McCallum.
- Electric Railway Improvement Company, Cleveland, Ohio, spaces 386, 388, 389, Building 3. Electric weld rail bonding car, electric weld rail bonds. Represented by E. E. Schmid, W. E. Huber, G. Howatt.
- ELECTRIC RAILWAY JOURNAL, spaces 2-6, Building 1. (See under McGraw Publishing Company.)
- Electric Service Supplies Company, Philadelphia, Pa., space 311. Prepayment car models, "Protected" rail bonds, Automotoneer, Garton-Daniels lightning arresters, Lyon reinforced-steel gear cases, Keystone overhead material, Keystone pneumatic gong ringer, sander, whistles and valves; Keystone block signals, Keystone highway crossing signal, Keystone flag-station signal, track drills, trolley catchers and retrievers, and many other specialties. Represented by Charles J. Mayer, J. W. Porter, A. H. Englund, J. V. E. Titus, Max A. Berg, H. G. Lewis, E. R. Mason, T. W. Casey, H. Murdock, M. Earl, T. Hinckle, W. Hamer, W. A. Cockley, W. A. Armstrong, Jr., J. R. McFarlin, F. C. Peck, F. A. Strail, J. G. Duncan, R. D. Brown, G. Miller, R. Montgomery.
- Electric Traction Weekly, Chicago, space 3. Represented by H. J. Kenfield, G. R. Blodgett, G. S. Davis, W. J. Field.
- Ellecon Company, New York, N. Y., space 333, Building 3. Ellecon conduit fittings, metal car signs and racks, air brake and control circuit interlocks, automatic overload stop for electric controllers. Represented by W. R. Hamilton, Butler Keys.
- Emery Pneumatic Lubricator Company, St. Louis, Mo., space 219. Pneumatic lubricators and lubricants for traction air brake equipment. Represented by E. A. Emery, N. J. McAloney, Alexander Steiner.
- Eureka Tempered Copper Company, North East, Pa., space 268, Building 2. Journal bearings, commutators, trolley wheels, line material. Represented by O. C. Hirtzel, T. E. Lynn, Fred. Rundell, C. D. Videtto.
- Flood & Conklin Company, Newark, N. J., spaces 258-260. Varnishes and surfacers of the Simplex system. Represented by H. J. Kuhn, L. A. Williams.
- Flood Concrete Tie Company, Bridgeport, Conn., space 169, Aquarium Court. Reinforced concrete railroad ties and insulated ties of same construction, all equipped with different improved fastenings. Represented by John H. Flood, L. E. Youngs, Webster W. Dorr.
- Forsyth Brothers Company, Chicago, Ill., spaces 342-344. Pressed-steel doors, brass and steel window sash, weather strips, sash locks; pressed-steel step ladder, carlines, posts, unit-section side formations, deck sash operating devices, including ratchets, models of draft gear, buffing device, drawbar centering device. Represented by A. H. Sisson, William M. Wampler.
- Ford & Johnson Company, Michigan City, Ind., booth 269, Building 2. Car seats.
- Galena Signal Oil Company, Franklin, Pa., spaces 39-42. Reception and rest room. Represented by C. C. Steinbrenner, George A. Barnes, R. C. Smith, E. H. Baker, E. G. Beatty, R. H. Craig, L. J. Drake, Jr., A. O. Fletcher, J. C. Glair, A. Green, F. A. Guild, E. M. Hedley, W. H. Lee, H. C. Mason, W. A. McWhorter, C. L. Richards, George J. Smith, J. E. Southwell, W. O. Stieff, L. R. Speare, C. E. Schaufler, C. A. Record, D. A. J. Sullivan, W. A. Love, F. R. Stakelum, C. H. Thomas, A. M. Wilson, W. A. Trubee.
- General Electric Company, Schenectady, N. Y., spaces 25 to 38, Building 1. Railway motors, air compressors, Sprague-General Electric Type-M control equipment, straight air brake equipment, controllers, commutator grooving machine, gears and pinions, steam and air flow meters, railway supplies, headlights, transformer oil dryer and purifier, ozonator, lightning arresters, Curtis turbine, gas-electric motor car, battery truck crane. Represented by J. G. Barry, F. H. Gale, F. E. Case, W. G. Carey, E. D. Priest, E. P. Waller, G. L. Schermerhorn, G. H. Hill, E. H. Anderson, C. E. Barry, H. N. Ransom, W. B. Potter, G. R. Parker, J. Stanton, R. E. Woolley, L. W. Shugg, C. Fair, H. L. Monroe, J. W. Buell, C. Dorticco, H. C. Marsh, W. A. Woolford, W. J. Clark, S. W. Trawick, C. B. Kayes, H. G. Grier, G. D. Rosenthal, A. H. Russell, A. V. Thompson, C. C. Peirce, E. H. Ginn, Ralph Moore, W. O. Kellogg, W. H. Sigourney.
- General Railway Signal Company, Rochester, N. Y., space 420. Absolute permissive block system, showing a working track model with full-sized signals (semaphore and light type) controlled by continuous track circuits and operated by train movements; G. R. S. telephone se-

- lector system for train dispatching and selective signaling, showing dispatcher and substation equipment, also signals controlled by dispatcher; model 2-A a. c. direct-connected signals; model 2-A a. c. base of mast signals; light signals (day and night indications); universal poly-phase relays; universal switch indicators; universal wall-type polyphase relay; single reactance bond; universal signal transformers; universal switch box; views of important a. c. signaling installations. Represented by W. W. Salmon, G. H. Groce, W. K. Howe, H. M. Sperry, M. F. Geer, W. J. Plogsted, R. C. Leake.
- Globe Ticket Company, Philadelphia, Pa., space 279, Building 2. Tickets, books, transfers, cash fare receipts, punches, ticket destroyers. Represented by W. C. Pope, P. C. Snow, R. C. Osman, E. Elliott.
- Goldschmidt Thermit Company, New York, N. Y., spaces 212, 214, 69, 171. Materials and appliances for welding rails by the Thermit process, including crucibles, Thermit molds, patterns, preheating appliances, rail grinder, etc.; metals and alloys produced free from carbon by the Thermit process; materials for welding tubes and pipes; process also illustrated by means of moving pictures, showing all steps in the operation of welding broken locomotive frames and welding rails. Represented by William C. Cuntz, L. Heynemann, G. E. Pellissier, H. S. Mann, J. G. McCarty.
- Gold Car Heating & Lighting Company, New York, N. Y., space 217. Quick-detachable ventilated core electric heaters, vacuum compound coil electric heaters and Cyclone ventilators. Represented by Edward E. Gold, E. B. Wilson, J. M. Stayman, F. H. Smith, F. Cahill.
- Griffin Wheel Company, Chicago, spaces 138, 140, Machinery Hall. F. C. S. chilled-iron car wheels. Represented by C. K. Knickerbocker, C. P. Dennett, A. A. Hale.
- Guenther Publishing Company, New York, N. Y., space 8, Building 1. Display of copies of the *Financial World*, a weekly publication issued in the interest of individual investors which particularly features the possibilities of electric railways and public utilities for attractive investments. The *Public Utility Review* is published annually. Represented by Lewis Guenther, William Durnagle, John D. Lane.
- H. K. B. Manufacturing Company, Newark, N. J., space 803-C, Aquarium Court. Model of automatic centrifugal journal oiler in operation. Represented by Charles F. Beers.
- The Heany Company, New York, space 418. Heany fire-proof wire, armature and field coils, Heany lamps, asbestos tapes. Represented by F. A. Duff, F. A. R. Hoffeditz, R. K. Dana.
- Hale & Kilburn Company, Philadelphia, Pa., spaces 421-424. Walkover seats in iron and pressed steel designs; steel interior finish, steel sash, steel doors, steel seats, fittings, etc.; canvas-lined rattan seat covering. Represented by Victor von Schlegell, Raymond H. Pilson, A. F. Old, F. C. Edson, C. W. Laskay.
- Hess-Bright Manufacturing Company, Philadelphia, Pa., spaces 146, 148. Ball-bearings for railway main journals and motor armatures. Represented by W. L. Batt, E. W. Rubencame.
- Heywood Brothers & Wakefield Company, Wakefield, Mass., spaces 439-440. Universal car seats. Represented by Bertram Berry.
- Holland Trolley Supply Company, Cleveland, Ohio, space 414. Holland ball-bearing trolley base, anti-friction pin plates, mine trolley base for electric locomotives, trolley harps, Potts mine trolley harp, trolley wheels, mine trolley wheels, Potts mine roof drill, trolley protectors, sleet cutters, Archer swivel trolley harp. Represented by H. W. Cole.
- Home Rubber Company, Trenton, N. J., space 274. Black sheet packing N. B. O., red sheet packing, diagonal packing for high and low pressure, hydraulic packings, tubular gaskets, automobile tires. Represented by W. J. B. Stokes, A. R. Foley.
- C. W. Hunt Company, New York, spaces 150, 152, 154, 156. Industrial tracks and cars, valves, models of coal and ash handling machinery, bucket conveyor, photographs of power plants equipped with Hunt machinery. Represented by J. Day Flack, Joseph P. Maxwell, Andrew J. Summers.
- Hunter Illuminated Car Sign Company, Flushing, N. Y., space 44. Destination car signs. Represented by Lytle J. Hunter, Harry Reisiger.
- Interlocking Nut & Bolt Company, Pittsburgh, Pa., space 179. The Clark nut lock. Represented by R. A. Clark.
- Indianapolis Brass Company, Indianapolis, Ind., space 210. Overhead trolley material, car equipment specialties, motormen's mirrors, pole sleeves, line suspensions, line hardware, linemen's tools, high speed switch, removable register handles. Represented by James H. Drew.
- International Register Company, Chicago, Ill., spaces 201, 203, 205, Building 2. New International coin register mounted on bulkhead of pay-as-you-enter car, coin register mounted on control stand of pay-within car, new G-7 International single registers, standard R-7 and R-5 registers, car fittings, Heeren enamel badges, International ticket punches, waterproof trolley cord and bronze wire center bell cord. Represented by A. H. Woodward, John Benham.
- Jeandron, W. J., New York, N. Y., space 226, Building 2; "Le Carbone" carbon brushes. Represented by W. J. Jeandron, Halsey Steins.
- Jenkins Brothers, New York, Philadelphia, spaces 134-136. Steel globe and gate valve for high pressures, brass and iron valves for power houses, and packing for steam joints; water gages and other power house accessories. Represented by W. S. Corcoran, Frank Martin, C. B. Yardley, Jr.
- Johns-Manville Company, H. W., New York, N. Y., spaces 237, 239, 241. J-M fibre conduit for underground work; J-M Linolite system of lighting; overhead trolley and transmission line fittings; J-M Transite ebony asbestos wood and J-M Transite asbestos wood; "Noark" car fuse boxes and "Noark" N.E.C.S. protective devices, such as fuses, cutouts, service switches, etc., Solderall soldering paste; J-M friction tapes and splicing compounds. Represented by J. W. Perry, H. M. Slauson, Wm. D. Ligon, J. H. McManus, H. M. Voorhis, C. W. Schultz, H. M. Frantz, George A. Saylor, R. R. Braggins, Daniel Pitts, E. B. Hatch, W. R. Seigle.
- Johnson Coin Counting Machine Company, New York, spaces 261, 263. Johnson coin counting machines and registering fare boxes. Represented by C. H. Birdsall, W. P. Butler, S. F. Champion, Jr., J. M. Johnson.
- Kerwin Machine Company, Detroit, Mich., booths 183-A and 183-B. Kerwin-Detroit rail grinder. Practical demonstrations of methods employed in grinding out high joints, low and battered joints and corrugations. Represented by James J. Kerwin and W. W. Clark.
- Lobdell Car Wheel Company, Wilmington, Del., space 253, Building 2. Steel and chilled iron car wheels, chilled iron plungers for boiler feed pumps. Represented by F. A. Lex, Joseph Stuart, Geo. C. Lobdell, third.
- Long Company, E. G., New York, N. Y., space 251. Reception room. Represented by E. H. Mays, Frank Van Anden.
- Lord Manufacturing Company, New York, space 418. Earll retrievers and catchers, Shaw lightning arresters, laminated rail bonds, Spencer air-purifying system, Bradshaw skids, con-tro-la-tors, M. V. G. arresters, luminator arc lamps, duo-contact fingers, disk and drive hydro-grounds, ground plates. Represented by W. R. Garton, A. V. Arnold.
- Lorain Steel Company, Johnstown, Pa., spaces 348, 353, Building 3. Special track work, girder and high T-rails, electrically welded joints. Represented by James M. Brown, F. J. Drake, S. P. S. Ellis, H. C. Evans, E. M. Fry, A. L. George, F. Glenton, Jr., Wm. W. Kingston, H. F. A. Kleinschmidt, Wm. Lynam, J. H. MacCarroll, S. P. McGough, Edward Ott, Geo. W. Reese, H. C. Stiff, A. L. Verner.
- Lubricating Metal Company, New York, space 187, Aquarium Court. "No Heat" babbitt metal and die cast bearings. Represented by T. H. Soule, W. E. Warren.
- McCabe, J. J., New York, N. Y., spaces 127, 129, 131, Machinery Hall. "New style" 2-in-1 double spindle motor-driven lathe with 26-in. and 48-in. swing. Triple-gear swing lathe in operation. Street railway repair shops lathe for work of all classes. Represented by J. J. McCabe, H. P. McCabe, Frank Sheeran, Geo. L. Bennett, W. Priestley, Fred Kompass.
- McCord Manufacturing Company, Chicago, space 330, Building 3. Universal car window fixtures. Represented by B. S. McClellan and R. N. Kennington.
- McConway & Torley Company, Pittsburgh, Pa., spaces 310, 312, 314. Janney radial coupler equipment. Represented by S. C. Mason, I. H. Milliken, H. C. Buhoup.
- McGraw Publishing Company, New York, spaces 2-6, Building 1. ELECTRIC RAILWAY JOURNAL, Convention Souvenir Number and four Convention Daily issues; Electric Railway Dictionary; Electric Railway Manual (Reference Book); McGraw Electrical Directory, Electric Railway

- Edition; *Electrical World*; *Engineering Record* Represented by James H. McGraw, Hugh M. Wilson, Joseph A. Kucera, Henry W. Blake, L. E. Gould, Rodney Hitt, F. Nicholas, Walter Jackson, Harold W. McGraw, George MacMurray, Frank Armeit, F. C. Wells, C. B. Merritt, J. J. Rockwell, C. A. Babbiste, W. K. Beard, C. T. Walker, E. J. Hunt, P. T. Coburn, J. B. Malette, Miss Josephine Phelps, Miss Jennie Johnson, L. S. Louer, S. T. Henry, I. H. Holbrook.
- McGuire-Cummings Manufacturing Company, Chicago, Ill., space 272. Represented by John J. Cummings, M. T. Kirschke, Jr.
- McQuay-Norris Manufacturing Company, St. Louis, Mo., space 308. "Leak-proof" piston-head packing rings for engines, pumps and compressors. Represented by W. K. Norris, E. H. Hill.
- Massachusetts Chemical Company, Walpole, Mass., space 234. Rubber and liquid insulating materials. Represented by L. O. Duclos, A. E. Duclos, E. W. Furbush.
- Matthews-Davis Tool Company, St. Louis, space 119, Machinery Hall. Davis expansion car-wheel boring tools and Davis expansion boring tools for general machine-shop work. Represented by Claude L. Matthews and J. W. McKeen.
- Matthews & Brothers, W. N., St. Louis, space 119, Machinery Hall. Matthews money-saving specialties, Matthews fuse switch, Matthews hold-fast lamp guards, Matthews boltless guy clamps, Matthews easy lamp changers, Matthews two-bolt guy clamps, a new trolley frog and Matthews "O. K." sheet cutters. Represented by Claude L. Matthews.
- May & Turner Company, Atlanta, Ga., space 413, Building 3. Burroughs' railway nut lock. Represented by O. B. Burroughs, Sterling G. Turner, Samuel C. Watkins.
- Midvale Steel Company, Nicetown, Philadelphia, Pa., spaces 433, 434, 435, 436. Two rolled steel wheels (unmounted), one pair rolled steel wheels mounted on axle (Boston & Northern Railway standard), two built-up wheels (unmounted), two heat-treated axles, one pair rolled steel wheels mounted on axle showing mileage made in service on Market Street Elevated Railway, Philadelphia. Represented by H. M. Deemer, W. S. Edger, T. W. Illingworth, Charles Tietze, James Thompson, Stuart Hazlewood, Morgan D. Hayes.
- Nachod Signal Company, Philadelphia, Pa., space 142, Machinery Hall. One set Nachod automatic signals, Type LD for electric railways, connected up for operation on a miniature track. Directional and non-directional trolley contractors, main relay, directional relay, spare and repair parts. Represented by Carl P. Nachod, F. W. Kulicke.
- National Brake Company, Buffalo, N. Y., spaces 262, 264. Aluminum models of the C. A. and B-5 types of Peacock brakes, aluminum model of the Ackley adjustable brake, two new types of brakes, the improved Peacock brake and a steam railroad brake. Represented by Frank D. Miller, W. D. Brewster, Thomas C. Boyce.
- National Brake & Electric Company, Milwaukee, Wis., spaces 120-128, Machinery Hall. City and interurban air-brake equipments, 600-volt and 1200-volt d.c. compressors and governors, sectional compressors, governors and engineers' valves; portable motor-driven air-compressor outfits, as well as portable gas-driven compressor outfit; combined motor-driven portable air-compressor and vacuum pump outfit; motor-driven "3VS" 100 cu. ft. air compressor complete with automatic controlling devices; belt-driven air compressors; air-brake and compressor parts; samples of steel castings. Represented by R. P. Tell, C. N. Leet, W. J. Richards, Robert Long, C. P. Billings, W. H. Beattys, James Paton, W. H. Goble, W. M. Bisel, J. J. Nef, W. D. Glenn, B. S. Aikman, George C. Anthon.
- National Carbon Company, Cleveland, Ohio, spaces 176 to 178. High-grade carbon products for street railway motors, stationary motors and generators, carbon brushes for miscellaneous uses and results of service tests, miscellaneous carbon products. Represented by F. D. Kathe, O. T. Weaver, H. A. Worman, A. E. Carrier, B. Dyer, W. B. Brady, E. H. Martindale, J. E. Hauser, D. D. Dickey.
- National Lead Company, New York, spaces 317-319. Phenix babbitt metal, heavy pressure metal, anti-friction metal, bearing metal, Sterling journal metal, bar solder, wire solder. Represented by J. B. Mendenhall, Wm. A. Dail, E. A. de Campi.
- National Lock Washer Company, Newark, N. J., spaces 320, 322, Building 3. Car curtains, curtain fixtures, sash locks, sash balances, National lock washers with models of same, separate fixtures, etc. Represented by F. B. Archibald, R. B. Brown, W. C. Dodd, J. H. Horn, D. H. Hoyt.
- National Surety Company, New York, space 173.
- National Tube Company, Pittsburgh, Pa., spaces 354-357. Shelby trolley poles, National tubular street poles, pipe of various kinds, Shelby seamless and Spellerized steel boiler tubes, cast and malleable iron fittings, valves and cocks, Kewanee specialties, also, seamless steel table top, consisting of thousands of pieces of various shapes of seamless steel tubing. Represented by L. F. Hamilton, J. G. Bateman, W. S. Bitting, B. F. Bart, J. E. Flemming, P. C. Patterson.
- Nelson Valve Company, Philadelphia, Pa., spaces 123-125, Machinery Hall. Bronze and iron gate, globe and angle valves, iron body globe and angle valves, blow-off valves, steel gate valves and steel globe valves for superheated steam and steel fittings, electrically operated gate valve. Represented by Carlisle Mason, Russell Bonnell, W. J. Spencer, R. E. Thomas.
- New York Air Brake Company, New York, spaces 229-231. Ten-car train electro-pneumatic air-brake equipment for electrically-operated trains. Represented by W. T. Henry, N. A. Campbell, C. E. Leach, J. D. Cartin, H. E. Whittaker, B. J. Minier.
- New York Switch & Crossing Company, Hoboken, N. J., spaces 248, 250, 252, Building 2. Anti-straddle solid manganese tongue switch and mate, 9-in. rail hard-center combination tongue switch, T-rail hard-center anti-straddle tongue switch, hard-center mate, frog and crossing with all the modern girder rail sections. Represented by W. C. Wood, H. R. Sherman, A. W. Kennedy, Wm. Weller, John Madge.
- Niles Car & Manufacturing Company, Niles and Cleveland, Ohio, space 273, Building 2, Marine Hall. Convention office headquarters only. Represented by F. C. Robbins, J. A. Hanna, A. W. Schall.
- Nuttall Company, R. D., Pittsburgh, Pa., spaces 147-149. Gears, pinions, trolley bases, trolley poles, harps and wheels, flexible couplings, special machine gears, gear-cutting machine in operation. Represented by F. A. Estep, Charles N. Wood, J. S. Monroe, G. E. Watts, T. M. Cluley, R. M. Kerschner, F. M. Erb, W. H. Thompson.
- Ohio Brass Company, Mansfield, Ohio, spaces 242-247. Rail bonds. Demonstrations in applying all-wire rail bonds by thermo bonding process: new overhead line material, malleable iron frogs and crossovers with renewable-bronze tips, locking hanger, tight-lock ear; extruded ear, etc.; M. C. B. type and regular type of Tomlinson couplers, air sander equipment, whistles and whistle valves, all in operation; also special type of Tomlinson coupler for Boston Elevated Railway, which automatically couples both cars and air hose; representative line of O-B high-tension pin suspension and type insulators; wall and roof bushings, busbar insulators; suspension clamps, tower eyes, strain and catenary insulators, etc. Represented by twenty men from main and branch offices, sales and engineering departments.
- Ohmer Fare Register Company, Dayton, Ohio, spaces 200-206. Sixty-fare register; fare register, push and pull operation; register with time feature and for four classes of fares; fare register, fourteen fares; six-fare register; one-fare register; two-fare time feature register with total adder; four-fare, cash adder, ticket and transfer register; six-fare register; rapid transit equipment for prepayment cars; station indicator and accident prevention device; turnstile register combination. Represented by John F. Ohmer, J. H. Stedman, J. C. Liggett, C. V. Funk, C. W. Ketteman, W. H. Nelson.
- Pantasote Company, New York, space 301. Pantasote and agasote. Represented by John M. High, William A. Lake, Allan S. Barrows.
- Par Sil Metal Company, Lansdale, Pa., space 275, Building 2. Flower brush holders, air brake and controller handles, carbon bronze bearings, trolley wheels, line ears. Represented by David B. Flower, Fred W. Roth.
- J. W. Paxson Company, Philadelphia, Pa., space 249, Building 2. Steel wire frog and switch brooms, wire brushes, wire and rattan brooms. Represented by John S. Gilbert.
- Pennsylvania Steel Company, Steelton, Pa., and Maryland Steel Company, Sparrows Point, Md., spaces 12, 14, 16, 18. Switches, mates, frogs, crossing pieces, switch stands and steel products for street railway track work; built up "Manard" hard centre and solid "Manard" construction. Represented by H. F. Martin, Richard Peters, T. C. Voorhees, John C. Jay, Jr., R. W. Gillespie, J. B. Smiley, R. Smith, Chas. S. Clark, T. Blagdon, Jr., H. G. Barbee, N. E. Salsich, S. H. Smith, E. E. Goodwillie, R. E. Belknap, D. Allen, J. T. Hennessey, J. G. Miller, R. C. Hoffman, Jr., H. M. Foster, J. T. Hill, G. S. Vickery, W. H. Henderson, C. A. Langdon, C. A. Alden.

- Perfectol Company, Philadelphia, Pa., space 43. Perfectol car cleaner, an oil emulsion cleaner for car woodwork. Represented by Henry Roever, James McD. Holtzinger.
- Philadelphia Holding Company, Philadelphia, spaces 332-4-6, Building 3. Halsey radial truck. Represented by J. R. Dickey, James T. Halsey, J. T. Sill.
- Pittsburgh Steel Company, Pittsburgh, Pa., spaces 222, 224. Building 2. Mechanical and boiler tubes, trolley poles. Standard railroad fencing, wire nails, fence staples and galvanized barbed wire. Represented by E. S. Lewis, H. C. Woodside, J. A. Voelker.
- Poole Brothers, Chicago, Ill., space 315. Railway tickets, folders, advertising booklets. Represented by S. K. Poole, R. W. Hunter.
- Positive Clutch & Pulley Works, Buffalo, N. Y., spaces 262, 264. Positive combined jaw and friction clutch models. Represented by S. A. Benedict.
- Prepayment Car Sales Company, New York, space 311, Building 3. Full-size model of prepayment car. Represented by Thomas W. Casey, David Murdock, A. H. Englund.
- Pressed Prism Plate Glass Company, Chicago, space 191. Special ornamental glass designs for railway cars. Represented by A. O. Brown and L. R. Waterman.
- Pyrene Manufacturing Company, New York, N. Y., space 165. Pyrene fire extinguishers, Pyrene liquid. Represented by H. T. Porter, G. H. Peterson, H. C. Futch, C. E. Ware.
- Rail Joint Company, New York, N. Y., space 180, Aquarium Court Arcade. Continuous, Weber and Wolhaupter standard joints, Continuous and Weber girder and high T-rail points, Continuous and Weber insulated joints, Continuous frog and switch and compromise joints. Represented by W. E. Clark, E. A. Condit, Jr., W. A. Chapman, H. C. Holloway, R. R. Seward, R. W. Smith, G. W. Smith, J. C. Barr.
- Railway Age Gazette, New York, spaces 408, 410. Represented by C. R. Mills.
- Railway Improvement Company, New York, N. Y., spaces 335, 337, 339. Coasting time recorders, current time clocks, car meters. Represented by Frank Hedley, Rufus L. MacDuffie, A. J. Pizzini, W. O. Wade, George B. Campion, Garrit S. Cannon, Harry F. Keegan.
- Railway Motor Car Corporation, Philadelphia, Pa., space 412, Building 3. Reception parlor only. Represented by W. E. Harrington, E. J. Lawless.
- Railway Roller Bearing Company, Syracuse, N. Y., spaces 113, 115, Machinery Hall. Rollway bearing journal boxes for Baldwin, Brill and other standard trucks, Rollway bearing car wheel, Rollway bearing GE-216 railway motor, Rollway bearing induction motor, Rollway center plates. Represented by James N. Vandegrift, Raymond H. Carhart, John W. Hulburt, H. L. Aberdein.
- Railway Track-Work Company, Philadelphia, Pa., spaces 156, 158, 160, Machinery Hall. Rail-grinding machines for removing corrugation and grinding hammered and depressed joints. Represented by William D. Gherky, William B. Goodall.
- Railway & Industrial Engineering Company, Pittsburgh, Pa., space 328. Horn-type disconnecting and protective apparatus, commutator slotting tool. Represented by A. W. Burke, B. W. Kerr.
- Ramapo Iron Works, Hilburn, N. Y., space 400. Automatic safety switch stands and manganese special work, especially for private right-of-way on interurban lines. Represented by Arthur Gemunder, George E. Haring, Wellington B. Lee, James B. Strong.
- Recording Register & Fare Box Company, New Haven, Conn., space 130, Machinery Hall. Fare registers, fare boxes, trolley wheels, punches and other railway supplies. Represented by Frank B. Kennedy, M. DeForest Yates, O. W. Uthoff.
- Roebing's Sons Company, John A., Trenton, N. J., spaces 225-227, Building 2. Wire rope and fittings, bare and insulated wire and cables. Represented by A. B. Conover, U. G. Tingley, M. R. Cockey, G. R. Swan, A. V. Errickson.
- Rooke Automatic Register Company, Providence, R. I., space 346, Building 3. Rooke automatic register. Represented by George F. Rooke, W. A. Williamson.
- Root Spring Scraper Company, Kalamazoo, Mich., space 411. Root No. 2 special scraper, No. 3 heavy car scraper, No. 5 snow scraper, pneumatic snow scraper. Represented by F. N. Root.
- Samson Cordage Works, Boston, Mass., space 313. Trolley cord, bell and register cord. Represented by F. J. Coakley, R. G. Whiting, W. G. Webb, W. G. Woodworth.
- Schütte & Koerting Company, Philadelphia, Pa., space 151, Machinery Hall. Koerting double tube injectors, steam jet blowers, exhausters, syphons, spray nozzles and condensers; Schütte hard bronze valves, engine stops, non-return valves, precision gate valves, emergency with pilot valve, turbine trip throttle valves, free exhaust valves and hydraulic valves, balanced valves, torpedo oil burner and film heaters. Represented by J. J. Gessleman, H. Bacon, Paul Knauf.
- Sherwin-Williams Company, Cleveland, Ohio, space 20, Building 1. Passenger coach finishes, street car and railway varnishes, insulating varnishes, rattan seat enamel, concrete finishes, paint and varnish specialties. Represented by E. M. Williams, H. E. Billau, F. A. Elmquist, W. S. Hannon.
- Peter Smith Heater Company, Detroit, Mich., spaces 254, 256. Hot-water heaters; forced ventilation hot-air heaters. Represented by Daniel W. Smith, Elmer J. Smith, Harry S. Williams, Walter E. Hinmon.
- Speer Carbon Company, St. Marys, Pa., space 255, Building 2. Carbon brushes. Represented by J. S. Speer, G. P. Fryling.
- Standard Coupler Company, New York, N. Y., spaces 324-326. Shim slack adjuster. Represented by George A. Post, E. H. Walker, C. D. Jenks, George A. Post, Jr., W. H. Sauvage.
- Standard Leather Packing Company, Boston, Mass., space 409, Annex. Pair of car wheels to demonstrate packing. Represented by W. A. Farnsworth, P. H. Wilhelm.
- Standard Motor Truck Company, Pittsburgh, Pa., spaces 209, 211, 213, 215. No. 0-36 light weight maximum traction city and suburban double truck with one-wear forged steel wheels; No. 0-50 outside-hung motor city and suburban double truck with forged steel wheels; No. C-50 light weight pressed steel side frame city and suburban double truck for high speed service with forged steel wheels; one C-55 high speed double truck designed especially for Boston Elevated Railway with forged steel wheels; No. C-60 high speed "Interborough" double truck with forged steel wheels designed for Pittsburgh, Harmony, Butler & New Castle Railway; No. C-80 pressed steel side frame double truck with forged steel wheels for 100,000 capacity cars and trunk line service. Represented by R. L. Gordon, A. W. Field, W. G. Cory, G. N. Boyd, W. G. Price.
- Standard Paint Company, New York, N. Y., space 277. P. & B. insulating varnishes, compounds and tape. Represented by Charles E. Smith, Harold E. Lavelle.
- Standard Roller Bearing Company, Philadelphia, Pa., space 106, 108, Building 1. Car journal roller bearings, anti-friction bearings (ball and roller) of every description. Represented by T. F. Salter, J. G. Cooley, L. M. Watkin, Jr.
- Standard Underground Cable Company, Pittsburgh, Pa., space 282, Building 2. Lead-covered and armored power cables, bare and insulated wires, Colonial copper clad wire, trolley wire, Davis open air and station terminals, manhole junction boxes, cable jointing materials. Represented by A. A. Anderson, J. H. Lytle, Pittsburgh; H. P. Kimball, New York; T. E. Hughes, S. S. Warner, Philadelphia; F. C. Cosby, Boston.
- Star Brass Works, Kalamazoo, Mich., space 341, Building 3. "Kalamazoo" trolley wheels and harps. Represented by O. P. Johnson.
- Steel Tie Specialty Company, Cleveland, Ohio, space 189, Aquarium Court. Kohlmeyer clips for fastening steel rails to steel ties. Represented by M. F. Kane.
- Sterling Varnish Company, Pittsburgh, Pa., spaces 429, 430, Building 3. Have no display. Represented by Henry C. Todd, Alvin S. King, W. F. Hebard.
- Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., space 345. Dispatcher's signal system; railway, mine and rural mine telephone, iron-clad magnetos and jack boxes, loud ringing signal bells, connecting poles and magneto switchboard. Represented by J. O. Oliver, M. S. Van Vleet, E. P. Ellis.
- Symington Company, T. H., Baltimore, Md., spaces 427, 428. Journal boxes, journal box dust guards, ball-bearing center plates, roller side bearings. Represented by J. F. Symington, W. W. Rosser, C. J. Symington, T. C. de Rosset, A. H. Weston.
- Taylor Electric Truck Company, Troy, N. Y., spaces 110-118. M. C. B. quadruple high-speed truck, M. C. B. triple truck, L. B. double truck for pressed steel cars, improved S. B. swing motion truck, E. H. single truck for large single truck cars, elliptic springs and coil springs; several kinds of T. M. C. steel-tired wheels. Represented by John Taylor, Walter E. Taylor, C. H. Dodge, Chicago; Thomas Thornes.

- The Taylor Stoker Company, Providence, R. I., spaces 153-155. Built-up stoker. Represented by M. Alperu, J. F. Mallory and W. I. Bowden.
- Tool Steel Gear & Pinion Company, Cincinnati, Ohio, space 363, Annex. Gears and pinions, specially hardened and toughened. Represented by C. E. Sawtelle, Leroy Brooks, Jr., S. I. Wailes.
- Transportation Utilities Company, New York, N. Y., spaces 374, 375, Building 3. Steel subway door, Acme vestibule curtain and revolving shield, weatherproof window outfit, Acme vestibule diaphragms, Perfection sash balance and screen, metallic steel sheathing, National steel trap door with grab handles, National steel trap door without fittings, National standard roofing, "Chanareh" galvanized metal flooring, Eclipse deck sash ratchet, "Flexolith" composition flooring, "Tuco" friction curtain fixture, Resisto insulation, "Tuco" rack fixture, Liner elapsed time calculator, miscellaneous curtain parts. Represented by W. L. Conwell, R. M. Campbell, H. S. Humes, Thos. Dunbar.
- Trolley Supply Company, Canton, Ohio, space 207. Peerless No. 10 roller bearing trolley base, Star roller bearing trolley base, Knutson No. 5 trolley retriever, Knutson No. 2 trolley retriever, Ideal trolley catcher, Peerless Jr. headlight, semaphore headlight, Peerless check valve for air compressor. Represented by J. E. McLain, Jos. Hollis, Irving Fulmer.
- Union Switch & Signal Company, Swissvale, Pa., space 300. Light and semaphore signals for steam and electric roads, staff instruments, alternating-current track circuit apparatus, models showing different schemes of signaling for trolley roads, alternating-current signaling relays, indicators, etc. Represented by L. F. Howard, H. W. Griffin, H. A. Wallace, T. H. Patenall, E. R. Coe, J. W. White, H. S. Beakes.
- United States Electric Signal Company, West Newton, Mass., spaces 157, 159, 161, 163, Machinery Hall. Interurban signals, block signals, recording block signals, spacing signals, highway crossing signals. Represented by John J. Ruddick, Roland F. Gammons, II, William W. Harrington, J. Warren Putnam, James Rier, E. S. Olmsted.
- U. S. Metal & Manufacturing Company, New York, N. Y., space 186. Represented by B. A. Hegeman, Jr., C. C. Castle, J. J. Ross, H. A. Hegeman.
- U. S. Wood Preserving Company, New York, N. Y., space 303-D. Wood paving blocks. Represented by Alexander Reed, G. O. Strother.
- Under-Feed Stoker Company of America, Chicago, Ill., spaces 404, 406. Reception room only. Represented by C. S. Crowell, D. Hunter, Jr., W. T. Jordon.
- Universal Audit Company, New York, N. Y., space 415. Charts showing an analysis of a standard and complete commercial organization, booklets on economics, administration and efficiency. Represented by H. F. Stimpson, Frank G. Shinn.
- Universal Lubricating Company, Cleveland, Ohio, space 167. Tule No. 2 WW, solidified oil and waste impregnated; Tule No. 2 yarn, solidified oil and yarn impregnated; Tule No. 2 H, plain solidified oil; Tule No. 2 VH, plain solidified oil for grease cups. Represented by Chas. H. Clark, Sherman W. Seofield, T. U. Franklin.
- Universal Safety Tread Company, Boston, Mass., space 387. Safety treads for car steps, stations and platforms. Represented by F. W. Langford, A. E. Langford.
- Universal Trolley Wheel Company, East Berlin, Conn., space 343. Trolley wheels, harps, contact springs completed and in sections. Represented by L. J. Tetlow, L. H. Kendall, Henry Bancroft.
- W. T. Van Dorn Company, Chicago, Ill., spaces 175, 177. One each No. 39 and No. 40 M.C.B. drawbars complete with draft gear and anchor casting, one standard M.C.B. coupling, one No. 19 Van Dorn coupler with draft gear, two No. 250 Van Dorn coupling with draft gear, one No. 21½ head with complete draft gear, two No. 27 couplings, one No. 41 M.C.B. drawbar complete with draft gear and anchor casting. Represented by W. T. Van Dorn, H. E. Van Dorn.
- Van Dorn & Dutton Company, Cleveland, Ohio, space 132, Machinery Hall. Railway motor gears and pinions; armature and field coils; commutators; "Hard Service" portable drills and reamers. Represented by F. H. Zulauf, A. K. Baxter, G. N. Neubecker.
- Watson-Stillman Company, New York, spaces 338, 340. No. 4 girder rail bender, 30-ton laboratory press, 35-ton hydraulic rail bond compressor, Universal beam punch, telescopic motor lift, several types of hydraulic jacks, section of 30-ton Watson-Stillman jack, 1-in. two stage twin volute turbine pump in operation. Represented by Edwin A. Stillman, Major Geo. Gillon, Frank Clark.
- Western Electric Company, New York, N. Y., space 240. Telephone train-dispatching equipment; electric railway supplies; train-dispatching circuits; selectors; transmitters and receivers; drainage and repeating coils; interrupter; Blue Bell battery; Rotophone; overhead railway material; Electrosee third-rail insulators; Shelby seamless steel trolley poles; Kalamazoo trolley wheels and harps; M-B sand boxes, M-B trolley harps, etc.; Holland Trolley Supply Company's retrievers and catchers; Ackley and Peacock brakes; Benjamin lighting specialties; Cameron commutators; Crouse-Hinds headlights; Schwarze railroad crossing gong; Pyrene fire extinguishers; Thomas high-tension insulators; Electroline; Samson spot cord and conductors' punches. Represented by F. D. Killion, M. A. Oberlander, E. D. Hinman, J. C. Enders, R. H. Harper, J. C. Maxon, G. K. Heyer, R. F. Spamer, C. V. Jellison, H. F. Miller, New York; J. L. Ludwig, A. L. Hallstrom, J. R. Stroud, L. C. Collier, G. Sigg, W. R. Lyall, H. C. Owen, J. F. Davis, C. E. Robertson.
- Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., spaces 22-24, and odd numbers 133 to 143, Building 1. Railway motors, induction motors, K-type controllers and unit switch control circuit breakers, relays, overhead line material, lightning arresters and repair parts. Represented by E. M. Herr, L. A. Osborne, C. A. Terry, H. P. Davis, S. L. Nicholson, C. S. Cook, J. C. McQuiston, M. B. Lambert, J. W. Busch, A. A. Brown, E. P. Dillon, George Ewing, L. N. Reed, C. W. Register, H. C. Stier, F. N. Kollock, Thomas Cooper, S. J. Keese, T. J. McGill, C. I. Young, G. B. Griffin, C. H. Davis, H. L. Garbutt, F. C. Stieler, W. R. Scott, D. L. Beaulieu, H. C. DeCamp, F. C. Hornstein, G. S. Vail, J. E. Garrahan, T. F. McKenna, H. Beardley, J. R. Cox, T. C. Bayrs, J. C. Kyle, J. G. Miles, H. A. Faber, N. W. Storer, C. Renshaw, J. L. Davis, R. E. Hellman, W. Schlaake, R. L. Wilson, P. H. Smith and N. S. Braden.
- Westinghouse Lamp Company, Bloomfield, N. J., spaces 22-24 and 133-143. Railway incandescent lamps. Represented by Walter Cary and B. F. Fisher, Jr.
- Westinghouse Machine Company, East Pittsburgh, Pa., spaces 22-24 and odd numbers 133 to 143, Building 1. Several turbines of the impulse re-entry type. Represented by E. H. Sniffin, L. L. Brinsmade, H. P. Childs, L. C. Bullington and H. Van Blarcom.
- Westinghouse Traction Brake Company, Wilmerding, Pa., spaces 22-24 and odd numbers 133 to 143. Electro-pneumatic brake, A. M. M. automatic brake, S. M. E. brake equipment, electric compressor governors. Represented by John F. Miller, A. L. Humphrey, W. S. Bartholomew, E. L. Adreon, E. A. Craig, J. R. Ellicott, W. V. Turner, George H. Martin, P. H. Donovan, Arthur Johnson, C. H. Beck, S. D. Hutchins, C. J. Olmstead, C. P. Carr.
- Whitmore Manufacturing Company, Cleveland, Ohio, and Whitmore Product Sales Company, Chicago, Ill., spaces 162, 164-A. Gears and pinions with mileage records. Represented by S. W. Whitmore, William Beaser, Jr., Henry Stuckenholt, R. R. Hertzog.
- William Wharton, Jr., & Company, Philadelphia, Pa., spaces 13, 15, 17. Switches, mates and frogs of manganese steel construction, new and used; spring boxes, models, blue prints and pictures of the company's work. Represented by Victor Angerer, L. R. Ashhurst, Jr., R. C. McCloy, H. F. McDermott, Geo. R. Lyman, W. McLain, Arthur S. Partridge, Edwin V. Smith.
- Wilson Remover Company, New York, space 43. Paint and varnish removers. Represented by J. MacNaull Wilson and J. Whitney Wilson.
- Wheel Truing Brake Shoe Company, Detroit, Mich., space 347. Abrasive brake shoe. Represented by J. M. Griffin, H. Hart.
- Whipple Supply Company, New York, spaces 384-385. Anticlimbers, gears and pinions, Universal safety treads. Represented by A. L. Whipple, H. F. Stevenson.
- Wilson Trolley Catcher Company, Boston, Mass., space 503. Trolley catchers and retrievers, electric railway signals. Represented by Charles N. Wood, W. M. Chapman, Bert Wilson.
- Wonham, Sanger & Bates, New York, N. Y., spaces 218-220. "H. B." life guard, C. H. ampere-hour meters for traction operation, Trotter accelerometers, American Automatic Switch Company's devices, automatic counting in-and-out block signal. Represented by Roy Collins, R. Sanger, F. Wonham, D. Polderman, H. A. Goode and E. Sharp, London, England.